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**EVOLUTION OF ARTILLERY TACTICS IN GENERAL J. LAWTON COLLINS'
US VII CORPS IN WORLD WAR II**

A thesis presented to the Faculty of the U.S. Army
Command and General Staff College in partial
fulfillment of the requirements for the
degree

MASTER OF MILITARY ART AND SCIENCE

by

DAVID S. WILSON, MAJ, USA
B.A., Norwich University, Northfield, Vermont, 1985

Fort Leavenworth, Kansas

1996

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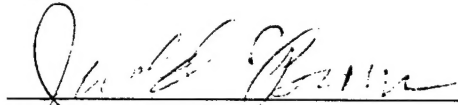
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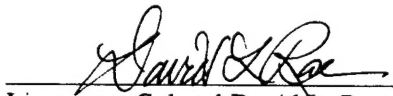
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ABSTRACT

THE EVOLUTION OF ARTILLERY TACTICS IN GENERAL J. LAWTON COLLINS' US VII CORPS IN WORLD WAR II by MAJ David S. Wilson, USA, 75 pages.

This thesis examines the evolution of artillery tactics in World War II using General J. Lawton Collins' US VII Corps as a case study. This study first reviews artillery doctrine and tactics during World War I and during the 1920s and 1930s, in which time future leaders like General Collins were military students.

In 1943, General Collins commanded an infantry division on Guadalcanal where he was one of the first American generals to implement the Army's new doctrine of fire direction centers (FDCs) and massed fires using time on targets (TOTs). Collins then was selected to command the US VII Corps for the invasion of Normandy and the subsequent breakout during OPERATION COBRA. From Normandy to the end of the war, Collins continued to hone his use of artillery based on his experience during the eleven-month campaign in Northwest Europe, contributing to his reputation as the best corps commander in World War II.

This study looks at Army doctrine in 1944 to judge Collins' artillery tactics and concludes that he used established doctrine and that his tactics are the foundation for today's artillery tactics.

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LIST OF ABBREVIATIONS

AAA	Antiaircraft Artillery
CAS	Close Air Support
CB	Counterbattery
CP	Command Post
CSR	Controlled Supply Rate
DS	Direct Support
ETO	European Theater of Operation
FA	Field Artillery
FDC	Fire Direction Center
FLOT	Foward Line of Troops
FO	Forward Observer
GS	General Support
INF	Infantry
OP	Observation Post
PZ	Panzer
SP	Self-Propelled
TPQ	Target Processing Radar
TOT	Time on Target
VGd	Volks Grenadier Division
WP	White Phosphorous

CHAPTER ONE

INTRODUCTION

This thesis examines General J. Lawton Collins' use of artillery in World War II. The Army's prewar manual, Field Manual 100-5 Operations, provided specific instructions on how to employ artillery. Collins would follow the fundamental principles of Field Manual 100-5 and employ his artillery based on the tactical situation. His use of artillery would parallel that of US forces in World War II. Early on, US forces believed that a moderate amount of artillery could achieve neutralization, but as the war progressed and the US suffered increased casualties, more artillery rounds would be used to achieve neutralization of German forces. Overall, the US Army in World War II followed the prewar doctrine of using fire direction centers (FDCs) to control and mass artillery and the tactic of time on targets (TOTs) but came to realize that more firepower was needed to accomplish the prewar definition of neutralization in order to win. Those interested in this thesis would be historians interested in the artillery tactics of World War II, and artillerymen who wish to examine how massed fires, in its simplest form with relatively simple technology, worked against fifty German divisions.

In World War II, the US field artillery was one of the key instruments of America's victory against the German Wehrmacht. In Northwest Europe, from June 1944 until May 1945, the US artillery deployed 400 artillery battalions in support of approximately fifty infantry and armor divisions. These units fired approximately fifty million shells. With such a massive infusion of artillery into the Northwest European campaign, how was the American artillery used to assist the infantry and armor? According to two British historians, Dominick Graham and Shelford Bidwell, German veterans rated American massed artillery as more lethal than the Russian artillery barrages at Stalingrad.¹ As General George S. Patton eloquently said, "the artillery won the war."²

General William E. Depuy, developer of the Army's doctrine of the Active Defense, said that his purpose as an infantry commander in World War II was to advance forward to position the artillery forward observers.³

With eleven months of combat in Northwest Europe, two US corps were engaged the longest: US V and US VII Corps. Of the two, VII Corps, under the command of Major General J. Lawton Collins, stands out. US VII Corps was responsible for the first victory in Normandy at Cherbourg and was selected to lead the breakout during OPERATION COBRA. It was VII Corps which stopped the German Mortain counterattack. As the war progressed, VII Corps captured Aachen, the first major German city to be captured, and along with General Matthew Ridgway's XVIII Corps, closed the German bulge in the Ardennes, linking up with General George Patton's Third Army at Houffalize.

VII Corps was the US Army's preeminent corps in Northwest Europe. Its success can be attributed to its commander, a future chief of staff of the Army, J. Lawton Collins. Collins earned the nickname "Lightning Joe," while fighting at Guadalcanal, one of America's first land victories in World War II. General Collins was unquestionably one of the best American generals in command of one of the best US corps. As an infantryman who graduated from the Field Artillery Officer Advanced Course--a rarity then as it is today--how did Collins' use of artillery contribute to his success?⁴ If artillery was influential in winning the war, and Collins was the best corps commander, then it would be worthwhile to examine Collins' artillery tactics.

Doctrine is defined as "fundamental principles by which military forces guide their actions."⁵ Tactics is defined as the "art of employing available means to win battles."⁶ According to British historian Jonathan B.A. Bailey, "The principles of fire support [artillery] which emerged in the First World War have not changed."⁷ Today, artillery doctrine and tactics are still relevant to the modern battlefield. In 1941, the US Army published its Field Manual 100-5, Operations. This manual covered the Army's basic doctrine, principles, and tactics. The 1941 manual, unlike today's manual, goes into detail on how to employ artillery.⁸

While not the purpose of this thesis, the evolution of Collins' artillery tactics of using more fires is relevant to the overall discussion of maneuver doctrine and tactics in World War II and may provide information to the unceasing debate between maneuverists and attritionists. World War II started off with the supposed preeminence of General Heinz Guderian's panzer tactics in Poland, France, and Russia. While "Blitzkrieg" raged from 1939-1941, some maneuverists ignore the fact that no significant German armored counterattack after Kasserine in 1943 ever succeeded against American forces. Looking at VII Corps, from Normandy and Aachen to the Ardennes, American superiority in artillery and the tactic of massed fires using time on targets stopped German panzer attacks every time.

The problem with this lesson learned is that the US Army as an institution forgets to mass fires and ignores the lessons of World War II. According to British historian John Ellis, for political and economic reasons, the US has chosen not to remember the hard truth of World War II, that victory was won through massed firepower.⁹ Also, according to another British historian, John Gudmundsson, the lesson of Vietnam taught the US Army to assign forward observers to the smallest unit and to piecemeal the artillery into battery-sized firebases. Further, with computer automation, this has caused the Army to try to service every target on the battlefield, regardless of its significance.¹⁰ This dispersion of artillery effects contrasts with Collins' use of artillery in World War II. After the war, Collins stated that massing fires at the right place was the key to his success in World War II.¹¹

In the evolution of warfare in the twentieth century, the US Army got a late start in World War I and deployed no more than forty Army divisions to France and fought for only six months. Further, the US Field Artillery was outdated, requiring the US to use French 75-millimeter field guns along with French artillery doctrine.¹² From 1920 until 1940, the US Army was one of the smallest armies in the world. With six divisions, the US Army was smaller than Poland's army of twenty divisions, which lasted only a month against forty German divisions in September 1939.¹³

America's resources to develop and test doctrine were austere. Further, a doctrinal debate raged over the preeminence of fires over maneuver.

When America entered World War II, it had an established doctrine, contained in Field Manual 100-5. This peacetime doctrine was developed by a small Army focusing on the lessons of World War I. This doctrine was implemented by a massed Army of citizen soldiers in a motorized war of attrition and maneuver. Compared to World War I in France, World War II was a war of maneuver. The first war lasted four years in France, whereas it took the Germans two months to conquer France in 1940 and the Allies four months to liberate France in 1944. Obviously, the operational tempo of war had changed since Verdun and the Somme. In World War II, new weapons appearing too late for World War I were fully integrated. The tank, the radio, and the airplane helped to evolve warfare into a more decisive combined arms mix. America's artillery was now in support of armored divisions and motorized infantry divisions.

With better communications, fire direction centers, and time on targets, most artillery in World War II was fired at targets of opportunity. The fundamental principles of artillery doctrine did not change from World War I to World War II, but the tactics did. These same artillery tactics are the foundation for today's tactics. By looking at Collins' corps, the best examples of the tactic of massed artillery fires will be seen.

Endnotes

¹Dominick Graham & Shelford Bidwell, Tug of War, The Battle For Italy:1943-45 (New York: St Martin's Press, 1986), 50, 403;

²Note: The Patton quote hangs on the wall at Knox Hall at Fort Sill, Oklahoma; yet it can not be found in Patton's autobiography, War As I Knew It;

³Paul H. Herbert, Deciding What Has to Be Done: General William E. Depuy and the 1976 Edition of FM 100-5, Operations (Fort Leavenworth: Command & General Staff College, 1988), 16.

⁴J. Lawton Collins, Lightning Joe: An Autobiography, (Baton Rouge: Louisiana State University Press, 1979) 46, 157.

⁵Department of the Army, Field Manual 100-5, Operations (Washington: Government Printing Office, 1993), G-3.

⁶Ibid., G-8.

⁷J.B.A.Bailey, Field Artillery and Firepower, (New York: Oxford Press,1987), 189.

⁸Note: With the exception of artillery tactics, the 1941 version of Field Manual 100-5 Operations, Chapters 9 and 10, on the offense and the defense, closely parallels the current version of the German Truppenfuhrung manual. This current version can be assumed to have some historical relevance to the 1936 Truppenfuhrung manual which the Germans used throughout WW II.

⁹John Ellis, Brute Force, Allied Strategy and Tactics in the Second World War, (New York: Viking Press, 1990), 540.

¹⁰Bruce I. Gudmundson, On Artillery, (Westport: Praeger Publishers, 1993), 151-152.

¹¹Gary Wade, editor, Combat Studies Report Number 5: Conversations With General J. Lawton Collins, (Fort Leavenworth: Command & General Staff College, 1991), 4-5.

¹²Geoffrey Perret, There's A War To Be Won: The United States Army In World War Two, (New York: Ballantine Books, 1991), 82; Gudmundson, 136.

¹³Perret, 23.

CHAPTER TWO

1914-1940: ROLLING BARRAGE

World War II artillery doctrine and tactics owe their origin to World War I and the years between 1920 and 1940. World War I was an artillery war; both the Allies and the Central Powers had thousands of artillery pieces. Consequently, artillery fire plans were complex. Most armies had a limited number of heavier weapons (150-to 200-millimeter) with a few approaching the size of naval cannons.¹ During a typical preparation, such as the Battle of the Somme in 1916, 1.5 million rounds would be fired-- two-thirds of these shells from 75-millimeter guns.² Overall, artillery and mortars were responsible for 60 percent of all casualties.³

In World War I, the intent of artillery was to destroy enemy defenses so that attacking infantry could maneuver freely. Planners were willing to give up the element of surprise if it afforded them the opportunity to provide mass fires to bear. As the war progressed, artillery battles, such as Verdun, were seen as a way to attrit the enemy. Even after consolidating on the objective, artillery was used to create protective barrages around objectives. A barrage describes artillery fired across a line that moved forward at specified times.⁴

The armies of World War I developed three terms to describe the effects of artillery: destruction, neutralization, and suppression. Destruction was the elimination of an enemy unit through overwhelming firepower. Most armies define destruction as inflicting 30 to 50 percent casualties against an enemy unit. With such losses, it is expected that a military unit can no longer exist. Next, was neutralization, a term developed later in World War I. This was the economical use of firepower to kill or destroy enough elements to make an enemy unit no longer capable of performing its mission. Unlike destruction, a neutralized unit may still exist, but its losses were such that it could no longer perform its mission. The last term was suppression. This was the

temporary effect of preventing a unit from manning its weapons during the impact of incoming rounds.⁵

The fundamental principles of artillery doctrine consisted of three concepts. First, artillery preparations would be fired before the ground forces attacked. This was intended to destroy or neutralize a defending unit. Next, was the principle of close supporting fires. This was the artillery support requested and directed by the ground force as it maneuvered and closed to defeat the enemy. Finally, was the concept of counterbattery, intended to defeat enemy artillery. Due to communications problems in World War I, close supporting fires were hard to coordinate, so units fired rolling barrages. These barrages were lines of impacting artillery rounds that moved forward ahead of the advancing infantry. This predetermined movement of the artillery was to makeup for the lack of communication between the guns and the maneuver force.⁶

The standard direct support artillery was a 75-millimeter gun with a range of 6,000 meters, and had the mission of cutting extensive wire obstacles. Instead of cutting the barbed wire, however, the 75-millimeter shells tended instead to detonate in the mud, thus being totally ineffective. Additionally, some of the 75-millimeter guns had the mission of counterbattery fire. This was planned to be executed at the last minute of the preparation to answer enemy counterpreparations. Also, due to the inaccuracy of counterbattery fire, chemical shells were planned to temporarily suppress enemy batteries.

General support weapons were 105-to 120-millimeter howitzers which fired out to 10,000 meters. In World War I, general support artillery had the mission of destroying trenches and strongpoints. Strongpoints were the primary target for artillery preparations, usually lasting a week. Airplanes were used to find entrances to these underground bunkers. The first priority was to destroy or collapse these entrances to prevent the enemy infantry from manning their trenches as the barrage moved on.⁷

Initially in World War I, there was not enough ammunition and target information available, so counterbattery was considered impractical. The British believed artillery should

remain masked and that premature counterfires caused unpredictable movement by the enemy, hence the use of counterbattery at the end of preparations. This failed to destroy enemy artillery and had only a temporary effect in suppressing it.⁸

By 1917, belligerents had realized that horrendous casualties were the result of artillery and the best way to reduce losses was through counterbattery. To improve counterbattery required improvements in survey, computation, target location, and meteorological conditions, which today are recognized as four of the five requirements for accurate predicted fire. Also, tactical fire control was needed to improve counterbattery.⁹ Another requirement for effective counterbattery was to have sufficient guns and ammunition.¹⁰

Finally, counterbattery required a tactical headquarters to plan and execute fires, while other artillerymen focused on close fires. In 1914, European armies and the US had no artillery commander above division level. World War I taught that counterbattery was best controlled at corps level. Logically, this was the most immediate headquarters not decisively committed to the close fight and had the planning resources and staff to track enemy batteries and assign fire missions to the corps' artillery force. This continued to be part of US artillery doctrine twenty-five years later in World War II.¹¹

Further refinement in counterbattery, was the development of target acquisition. The three methods developed were air observer, sound ranging, and flash spotting. Each had its unique advantages and drawbacks. Air spotting was more accurate, but without radios, information would be old by the time the pilot landed to report. Flash spotting was good only for locating direction of the battery. Sound ranging was somewhat accurate, but could be thrown off by the sound of numerous guns and weather conditions. By 1918, sound ranging could locate a battery to within 100 meters.¹²

Ammunition and transportation became intertwined problems. At the start of World War I, the average battery of four guns had 1,000 rounds, 250 rounds per gun. However, at four rounds a minute, a battery had only one hour of fire. The problem was how to get factory

output to the howitzer breech. Eventually, one-half of the trucks in World War I were relegated to transporting artillery ammunition.¹³ In the pursuit for higher rates of fire, logistics became more critical than ever before.¹⁴

The artillery tactics for destruction of enemy forces required massive logistical support. Artillery supplies and numbers of guns available became prerequisites for successful offensives. If lacking, then frontages for attack were reduced to achieve the proper mass of firepower. According to British historian Jonathan B. A. Bailey, "destructive firepower had become like an addictive drug."¹⁵ Combatants now had mathematical formulas for the appropriate number of guns and ammunition in order to plan successful operations to advance several thousand meters.¹⁶

In World War I, infantry attacks could not advance beyond the range of artillery. Especially in the US Army, tactics of close artillery support were ineffective. In order for the infantry attacks to succeed, artillery had to move forward to stay within range. This required some artillery to provide support, while other artillery moved. This was complicated by the fact that movement over a World War I battlefield was difficult. Further, the supported infantry required some means of communication with the artillery. These coordinated tasks were beyond the ability of World War I units.¹⁷

Advancing troops usually would take heavy losses from the enemy's counterpreparation, fired in anticipation of an attack. Further, week-long preparations gave the Germans enough warning to move adequate artillery into the area. Worst of all, 75-millimeter guns usually failed to cut barbed wire obstacles, leaving infantry further exposed to enemy counterpreparations. The ability of the infantry to pass adequate information back to the artillery was not possible. Even though it was doctrinal for artillery liaison officers to lay communication wire, such means were usually destroyed during the counterpreparation.¹⁸

The greatest challenge to effective artillery support in World War I was the artillery liaison mission. In the face of resistance, infantry needs artillery support. It was critical that this liaison officer gain the confidence of the supported infantry. When the artillery liaison officer lagged

behind the infantry and no longer could observe the forward line of troops, effective artillery support stopped.

Another problem was accurate locations of friendly and enemy forces during the heat of battle. Due to faulty wire communications, the only way to get this critical information back was via runner to the infantry or artillery command post which sometimes took hours. The most critical information the artillery needed was the location of the target, its description, and desired effects. One problem in discerning the timely need to get this critical information back to the guns was the fact that some of the artillery liaisons were the least experienced artillery officers. Further, these neophyte artillerymen usually lacked an understanding of maneuver tactics which impeded their abilities.¹⁹

One way to plan around this friction was preplanned calculations for the creeping barrage. At a planned time, fires would shift forward to destroy enemy machine guns and artillery. Doctrine stated that the infantry should follow twenty-five meters behind the barrage, while the gunners adjusted rounds forward at the rate of march. However, most gunners were only trained to shift 300 meters at a time, causing large gaps in suppression and eventually advancing well ahead of the infantry. This was referred to as "losing the barrage."²⁰

Overall, these tasks were beyond the level of US artillery units in 1918. This was a result of artillery not training as a combined arms team. This lack of training was further amplified by assigning artillery support to the infantry without any habitual association. Lack of training and habitual association reduced overall combat effectiveness of the artillery and its ability to provide effective fires.²¹

One example of the challenges of effective artillery coordination occurred on 18 July 1918. The US 7th Field Artillery (FA) was part of the artillery supporting the 28th Infantry Regiment of the US 1st Infantry Division. The mission of the 7th FA was to fire a rolling barrage. The liaison officer had communication with the infantry command post, and the barrage was fired successfully at 0435 hours. The 7th FA battalion commander was with the 28th Infantry regimental

commander. Overall, the artillery liaison officer observed that the preparation was effective. As the infantry advanced, one of the batteries moved forward to support the advance. The artillery liaison advanced forward, but was wounded, eliminating responsive support. By late morning, word finally reached the artillery that the infantry were out of range of the artillery. At this point, the artillery had to physically send reconnaissance parties out to find the infantry lines. This is one example of artillery support breaking down.²²

By July 1918 units, such as the 7th FA and 28th Infantry, had been in France twelve months and were among the more experienced units in the American Expeditionary Force. Despite this experience, American units still had difficulty coordinating effective artillery support. In the American Expeditionary Force, rolling barrages were effective if they were lifted at the designated time. After that, the infantry usually advanced beyond its artillery support, or more precisely, advanced beyond the range of communication to seek targets of opportunity. If engaged, these targets could have determined the outcome of the battle.²³

Another problem the 7th FA had was that their artillery brigade headquarters did not know where the forward line of troops was during the battle. Knowledge of friendly locations during a battle was necessary to avoid killing friendly troops. This leads to the question of fratricide. The French estimate that 75,000 of their casualties were caused from French artillery, and the "American artillery faced the same indictment."²⁴ In a war with 300,000 US casualties, this potentially is a serious concern.

An example of the better use of artillery occurred on 4 October 1918 when the US 1st Infantry Division attacked as part of the Meuse-Argonne offensive. By 1200 hours on 5 October, 1-26 Infantry had captured its first objective, a distance of 2,000 meters. The reserve battalion, 3-26 Infantry was to conduct a forward passage of lines. At 1315 hours, 3-26 Infantry was at its line of departure and had to wait for a fifteen-minute artillery preparation. The battalion advanced forward during this barrage with its artillery liaison officer who was using a field phone to communicate. Once the infantry advanced 1,000 meters to its objective, the liaison officer was

able to call planned targets on the Germans. According to the supported infantry, these rounds landed timely and accurately. Such successful application of artillery support was the exception and not the norm in World War I.²⁵

In 1918, the Germans adopted new artillery tactics. These tactics, devised by Colonel Georg Bruchmuller, involved shorter artillery preparations and massed fires at a single point. The goal of artillery fires was less on destruction, but more focused on neutralizing or suppressing the enemy. The Germans also attempted to create greater flexibility of the use of offensive fires. Under Bruchmuller, the artillery would now hit important targets, such as observation posts and command posts. Also, the German artillery would let subordinates update target locations prior to H hour.²⁶ Compare this to the centralized British system, which stated that artillery barrages were too complex to be modified by subordinate elements. The Germans also placed a greater importance on synchronizing close and deep fires, since the results were mutually dependent on each other. The Germans envisioned more than just a rolling barrage that started and stopped.

Bruchmuller emphasized the importance of combined arms cooperation by the artillery. Advancing infantry were given forward observers from the artillery batteries. Further, divisions were given additional corps artillery. The British in 1918 temporarily adopted tactics similar to Bruchmuller's; but in November 1918 to reduce casualties, the British went back to using multi-day preparations.²⁷ Bruchmuller's artillery tactics "not so much . . . determined the outcome of the First World War, but . . . formed the seed-bed for the new techniques . . . developed in the 1920s and 1930s and practiced in the Second World War."²⁸ Both, the Germans and the US would use variants of Bruchmullers' massed fires in World War II.

According to American historian Jonathan House, "No army entered World War II with the same doctrine that it had used twenty years before."²⁹ The US Army tactical doctrine was heavily influenced by the French Army of 1918. Consequently, in the 1920s, US doctrine continued to emulate that of the French. The 1923 US Army Manual of Tactics was a direct translation of a 1921 French manual. However, by 1925, the US Army discarded trench warfare

and began to train officers in the merits of maneuver warfare with smaller divisions and with additional artillery assigned at corps level.³⁰

Even though there was some discussion of aircraft supporting the infantry, most air enthusiasts advocated strategic airpower. Further, they argued aircraft should only engage targets beyond the range of the artillery. This division was perpetuated by the artillery community which saw itself as the primary supporter of the infantry. This conservative belief ignored the potential benefits of close air support and the potential synergy of simultaneous attack from air and artillery.³¹

In World War I, US infantry divisions had 28,000 men. This type of division was referred to as a square division because of two brigades each with four regiments. For static attrition warfare, this may have been appropriate, but such a large force was too large for modern mechanized warfare. After the war, review boards by senior officers were held which reaffirmed a square division. General John J. Pershing wanted a triangular division of 16,000, but was overruled by the Chief of Staff of the Army General Peyton March. A separate board was held for the artillery branch. One study suggested at least one battalion of artillery in support of an infantry regiment and a brigade of artillery supporting a division.³² General George Marshall, head of the Infantry School, believed that along with the flexibility of a triangular division came the requirement for more firepower which could be provided by modern artillery.³³

During the 1920s and 1930s, one of the recurring problems with artillery was training. In peacetime, gunners tended to focus on technical solutions and ignored the tactical applications of their work, while the infantry trained without the benefit or knowledge of artillery support.³⁴ At the same time in the 1930s, American artillery became obsolete. The only functioning piece the US had was the French 75-millimeter. The US also had several hundred French 155-millimeter howitzers for general support. However, the prime mover of this howitzer was an antiquated truck. Most were immobilized, requiring their crews to train with cheaper 37-millimeter guns instead.³⁵

Despite a lack of resources, especially during the economic depression of the 1930s, the US Army continued to think about the future of warfare. One of the lessons of the last war was that American artillerymen did not want to refight the artillery battles of World War I: "The First World War was one huge artillery battle after another. The principle tactic on both sides was to saturate a position with shell fire according to a preplanned mission worked out in detail over a month or more by artillery staffs."³⁶ What the American Army wanted was to fight "fast moving battles" which moved over terrain like "water."³⁷ In World War I, battery commanders directed fires from a hilltop and calculated data for the guns. Battery commanders had no direct contact with the infantry. Once the infantry advanced out of sight, the artillery had to displace to resume contact.³⁸

In 1939 the Infantry School published Infantry in Battle to refocus a peacetime army on lessons of the previous war. Infantry in Battle stated that no unit in World War I that had effective artillery support was defeated; whereas poor artillery support tended to lead to defeat. It further reiterated the World War I saying that "artillery conquers, infantry occupies."³⁹ Infantry in Battle discussed the use of artillery in World War I and stated that unplanned fires required time and extolled the virtues of planned fires. The Infantry School also identified the need for artillery observation posts to be able to see the locations of the infantry. It stressed the need for the artillery to be used at only important targets. Further, the Infantry School identified the need for artillery and infantry command posts to collocate and the need for habitual association.⁴⁰

During the 1930s, the Field Artillery School at Fort Sill developed new ways of massing fires on targets of opportunity. During World War I, this technique was not possible because it required forward observers to be in direct contact with a battery commander to adjust a single battery on to a target. Now, an entire battalion could engage a target. What made this possible was the development of man-portable field radios. Further, the observer would now talk not with a battery, but with a battalion fire direction center controlling three batteries. This fire direction concept was not unique and paralleled a similar development by the French. The French version,

called poste central du groupe, was located at an artillery battalion CP and had the mission of controlling battery fires.⁴¹ Also, in order to maintain small divisions with centralized firepower at corps, the US artillery would have numerous corps artillery units to reinforce divisional artilleries.⁴² During World War II, 60 percent of all artillery would be at corps level.

With the development of the fire direction center, the US artillery planned on fighting the next war differently. The fire direction center would calculate firing data and make tactical decisions. This enabled the artillery to now engage targets quicker and to mass on a single target using all howitzers of a battalion. Fire direction centers would now receive calls for fire from forward observers who traveled with the supported infantry or armor unit. Further, the US artillery developed a new tactic which was the artillery time on target. Now a target would be identified by the observer and all available guns would be brought to bear to fire at once at one location. The rounds would now impact simultaneously, thus amplifying the lethality and neutralizing effects of the artillery.⁴³

In 1935, the Field Artillery School developed "new ideas and methods [in] tactics and techniques," but "basic principles have in general remained the same, but applications have varied."⁴⁴ One of the major changes was the transition from battery to battalion as the standard fire unit. The reason for this was the efficiency in having a battalion process a call for fire versus several individual batteries. This was the ideal use of the newly designed fire direction center. The school was realistic in that in combat there are more calls for fire than can be serviced. Therefore, the best level for tactical fire direction was centralized control at battalion.

The Field Artillery School did not see this as a change in doctrine, but as a more efficient use of artillery assets.⁴⁵ The artillery liaison officer now became more than just a liaison, but a forward observer to request and direct artillery fires. Further, to facilitate speed and massed fire with observers, the artillery school developed check concentrations. These were target reference points which forward observers could adjust batteries onto and then shift fires to targets of opportunity.⁴⁶ Also, to assist in massing battalions, survey sections now established survey control

so that accurate locations were plotted by the battalion fire direction center.⁴⁷

The Field Artillery School developed tactical fire direction standards based on target areas and standardized fire commands which are still used today. For area fire, doctrinal templates were now developed to mass and plan fires. To facilitate fire support, units now had schedule of fires based on batteries, targets, total rounds, and relative H hour, the same as used today.⁴⁸ With targeting templates came the development of target overlays and standardized targeting numbers by artillery battalion.⁴⁹ Besides fire direction centers at battalion level, the new tactics gave division and corps fire direction centers the mission of designating fire missions and coordinating for additional reinforcing fires.⁵⁰

A modification of World War I tactics was the clear definition that fire missions were now neutralization missions. New charts were developed to assist fire direction centers in making this a tactical decision. Depending on a target area, neutralization by battalion was now determined to be a minimum of 40 to 260 rounds of 75-millimeter ammunition. These neutralization tables are comparable to today's use of massed fires at the Army's combat training centers which teach the technique of fire missions with no fewer than 72 rounds.⁵¹

One of the overall lessons from World War I was that infantry and artillery coordination was seriously lacking. The Artillery School determined that this was a result of the lack of qualified manning of liaison teams and lack of adequate equipment. In the next war, forward observers with radios would be a key component to success on the battlefield. The Artillery School further defined the mission of divisional artillery as solely to support maneuver. This early form of fire support was followed by the school's development of command liaison and unit liaison. These definitions would be understood today as the role of the fire support coordinator, who is the artillery commander, and of the fire support officer, who is the artillery liaison for the maneuver unit.⁵²

In World War I, a US divisional artillery consisted of a 155-millimeter howitzer regiment and two 75-millimeter gun regiments. Each 75-millimeter gun regiment had two battalions. These

battalions could support one of four infantry regiments organic to a square division.⁵³ From 1936 to 1939, the 2nd Infantry Division became the test bed division for the Army to test a new divisional artillery.⁵⁴ To implement these changes, the artillery acquired new weapons. At the end of World War I, the Westervelt Board had chosen the 105-millimeter howitzer as the preferred direct support weapon. In 1941, the 105-millimeter howitzer finally went into mass production along with a new 155-millimeter howitzer and a new eight-inch howitzer.

The artillery would now have a new generation of 2 1/2-ton trucks to move the artillery and enhance its mobility in supporting mobile operations. During the Louisiana Maneuvers in 1941, small Piper Cub airplanes for the first time were used by the artillery to spot targets.⁵⁵ As a result of all these changes, by "1942 the Army's artillery was a different force from what it had been in 1940."⁵⁶ The US Army consciously decided not to beat any future opponent with more guns, but to beat them by having a more efficient artillery organization. Based on this, the US Army was technologically ahead of other armies in the world.⁵⁷

In World War I, the US artillery quickly developed an artillery doctrine modeled on the French whose artillery it used.⁵⁸ During the 1930s, the US Army, like most armies, planned for a war of maneuver, while budget restraints prevented the purchase of new equipment to go along with this doctrine. This lack of new equipment did not prevent the US artillery from developing new tactics and techniques. The most significant developments were the new doctrine of fire direction centers and radio observers and the new tactic of massed neutralization fires, and the artillery time on target. When the US entered World War II, the US artillery had the new equipment needed for its tactics to fight the war. The doctrine and tactics developed in the 1930s by a cadre army of nine artillery brigades would now be employed by a citizen army of 800 artillery battalions.

Endnotes

¹Paddy Griffith, Battle Tactics of the Western Front: The British Army's Art of Attack 1916-1918 (New Haven: Yale University Press, 1994), 136-137.

²John Keegan, The Face of Battle (New York: Vintage Books, 1976), 227, 231.

³Jonathan B. A. Bailey, Field Artillery and Firepower (New York: The Military Press, 1989), 5.

⁴Bailey, 134, 137.

⁵Ibid., 16, 139, 143.

⁶Ibid., 127, 131.

⁷Keegan, 227-228, 231; and Griffith, 139.

⁸Ibid., 53-55.

⁹Ibid., 51; and Griffith, 136-137.

¹⁰Bailey., 56.

¹¹Ibid., 62; and War Department, Field Manual 100-5, Operations (Washington: Government Printing Office, May 1941), 10.

¹²Bailey, 61.

¹³Ibid., 26, 30.

¹⁴Ibid., 34.

¹⁵Ibid., 138, 140.

¹⁶Griffith, 149-151.

¹⁷Timothy Nenninger, "Tactical Dysfunction in the A.E.F., 1917-1918," Military Review, 51, number 4, (October, 1987): 178.

¹⁸Keegan, 247-248.

¹⁹C. T. Lanham and Edwin F. Harding, Infantry In Battle (Richmond, VA: Garret and Massie, 1939), 250-252.

²⁰Keegan, 248-249.

²¹Nenninger, 178-179.

²²Lanham, 254-256.

²³Ibid., 256-257.

²⁴Ibid., 257-258.

²⁵ Ibid., 271-272.

²⁶Timothy T. Lupfer, The Dynamics of Doctrine: The Changes in German Tactical Doctrine During the First World War (Fort Leavenworth: Command & General Staff College, 1981), 44-45.

²⁷Bailey, 144-149.

²⁸Ibid., 145.

²⁹Jonathan M. House, Toward Combined Arms Warfare: A survey of 20th Century Tactics, Doctrine, and Organization (Fort Leavenworth: Command & General Staff College, 1984), 43.

³⁰House, 69-71.

³¹House, 77; and Paul F. Gorman, The Secret of Future Victories (Fort Leavenworth: Command & General Staff College, 1992), II-19.

³²J. Lawton Collins, Lightning Joe: An Autobiography (Baton Rouge: Louisiana State University Press, 1979), 52-53.

³³Geoffrey Perret, There's A War To Be Won: The US Army in W.W.II (New York: Ballantine Books, 1991), 83; Note: It would not be until 1939 that the Army would adopt the triangular division. Collins, 53.

³⁴Bailey, 37.

³⁵Perret, 82.

³⁶Ibid., 84.

³⁷Ibid.

³⁸Ibid.

³⁹Lanham, 272-273.

⁴⁰Ibid., 274-276.

⁴¹Bruce I. Gudmundson, On Artillery (Westport: Praeger Publishers, 1993), 110, 121.

⁴²House, 77-78.

⁴³Perret, 84-85.

⁴⁴War Department, Digest of Field Artillery Developments (Fort Sill: Field Artillery School Printing Plant, 1935), intro-1.

⁴⁵Ibid., 2-3.

⁴⁶Ibid., 5, 7.

⁴⁷Ibid., 26-27.

⁴⁸Ibid., 21, 31-35.

⁴⁹War Department, Digest of Field Artillery Developments (Fort Sill: Field Artillery School Printing Plant, 1936), 42.; and War Department, Digest of Field Artillery Developments (Fort Sill: Field Artillery School Printing Plant, 1937), 34.

⁵⁰War Department, Digest of Field Artillery Developments, 1935, 39.

⁵¹Ibid., 115, 118.

⁵²War Department, Digests of Field Artillery Developments, 1936, 24-25.

⁵³House, 41.

⁵⁴Ibid, 72.

⁵⁵Perret, 85-86; and Gudmundsson, 137.

⁵⁶Perret, 87.

⁵⁷Ibid.

⁵⁸Gudmundsson, 136.

CHAPTER THREE

LESSONS LEARNED: GUADALCANAL TO AACHEN

General J. Lawton Collins, future VII Corps commander and Chief of Staff of the Army, was a product of the 1930s Army. During this time, Collins was both a student and an instructor in the Army's educational system. As a division commander and corps commander in World War II, Collins would fall back on the doctrine that he learned during his earlier education and with his aggressive leadership style in combat. Collins employed his artillery using Fort Sill's doctrine developed in the 1930s. However, based on the situation, Collins' artillery tactics would evolve and change over time.

General Collins graduated from the United States Military Academy in 1917. Upon graduation, Collins was assigned to the 22nd Infantry Regiment in New York City. The 22nd Regiment remained in the US and did not deploy during World War I. Collins would not fight in World War I, and would not see combat until 25 years later.¹

During the 1920s, Collins recognized aircraft, tanks, and communications as significant developments. Based on these new systems, Collins believed that the nature of war had changed, requiring more professional training. Possibly as a result of this observation, Collins attended the Field Artillery school at Fort Sill. While attending artillery observer training, Collins received an unprecedented one hundred percent score. As a result of his Fort Sill training, Collins believed that peace time artillery training was conducted without the coordination of friendly infantry forces and observed that this artificial training would cause problems in any future war. Collins was only one of two corps commanders in World War II who had the opportunity to go to Fort Sill as a second advanced course. Overall, he credited his Fort Sill training with his success during World War II.²

In 1934, while assigned to the infantry school as an instructor, Collins rewrote the Army's manual on drill and ceremony, emphasizing simplicity and making the manual much easier for any future army of conscripts to understand. Two years later, Collins attended the Army Industrial College. Collins knew little about logistics and said it was invaluable teaching. One lesson he learned was from a General Motor's executive who said, "The solution to [every] problem-- when it is found--will be simple."³ It can be argued that Collins employed the concept of simplicity and flexibility throughout his career as a division and corps commander.

On 6 May 1942, Collins became the commanding general of the 25th Infantry Division and owed his promotion to General Dwight Eisenhower, Chief of the War Plans Division, and to General George Marshall, Army Chief of Staff, who implemented a policy of assigning younger division commanders. As a new commander, Collins proceeded to train his division for the next six months focusing on regiments training with their supporting 105-millimeter howitzer battalions.⁴

Army doctrine in 1941 was that tactical aircraft did not support infantry. Collins wanted to develop a way to mark close targets for tactical aircraft and proposed using two white phosphorus (WP) rounds to mark targets for close air support. This required the artillery forward observer to know exactly where the forward line of troops was located. Collins conducted several tests, and was able to bring aircraft within 200 yards of friendly troops. In August 1942, Collins conducted a live fire exercise with artillery. Collins described the massed fires as "awesome and devastating."⁵

In November 1942, 25th Infantry Division was deployed to the South Pacific. Collins was forewarned that his division would relieve the 1st Marine Division at Guadalcanal. The 1st Marine Division had been on the island since 8 August 1942. Over the next five months, the 1st Marine Division and two regiments of the Americal Division defended against repeated Japanese attacks. By December 1942, the US forces had suffered 2,700 battle casualties.

Collins' immediate superior was Major General Alexander Patch, XIV Corps commander.⁶ Collins' first mission was to relieve the 1st Marine Division and the Americal Division. Collins assessed the tactical situation to be that "American artillery superiority forced Japanese to conceal their positions."⁷ He wanted to avoid frontal attacks against the Japanese and to use flanking maneuvers. Collins hoped to trap the Japanese and compel them to surrender. If they did not surrender, then Collins planned to destroy them with artillery. Collins intended that this would limit American casualties. Arguably, General Collins honed these simple division tactics and would employ these same tactics as a corps commander at Cherbourg and Aachen.

In his first attack, Collins' plan was to capture Galloping Horse Ridge and Matanikau. Using established artillery doctrine in his first attack, Collins had the 64th and 8th Artillery Battalions in direct support to their habitually associated infantry regiments. The other two artillery battalions would be in general support. Collins planned only an artillery preparation to be fired with priority of fires directed against an enemy stronghold that was blocking 27th Infantry's axis of attack, his main effort.⁸

Collins planned on firing artillery first and then sending in air attacks. On 10 January 1943, General Collins and the 25th Infantry Division saw their first combat. At 0550 hours, Collins' artillery fired a thirty-minute artillery preparation in front of the 27th Regiment. Collins' 105-millimeter howitzers fired 3,300 rounds, a small number by World War I standards. After the preparation, P-39s bombed Japanese positions. As a result of this artillery and air support, 1-27 Infantry advanced with no opposition, while 3-27 Infantry in the south took heavy casualties. On 12 January, at 0630 hours, following artillery and air attacks, 2-27 Infantry attacked through 3-27 Infantry. By calling in 81-millimeter mortars within fifty meters, the infantry were able to take all of Galloping Horse Ridge. General Collins had won a significant victory for American forces on Guadalcanal and his first victory as a commander, using infantry and artillery.⁹

During a double envelopment of Mount Austen by the 27th Infantry on 18 January 1943, the infantry were so close to the enemy and impacting artillery shells that they had to withdraw 300

meters. Collins, at an observation post, saw artillery rounds falling short on the infantry and ordered the artillery to cease fire. The divisional artillery commander, who was not anywhere near an observation post, protested the ceasefire. Collins reminded him that "it was Collins' artillery, not his."¹⁰ Collins believed that this commander did not understand that the artillery was a supporting role and not an independent arm.

On 22 January 1943, elements of the Americal Division and the 1st Marine attacked along a 1,000 meter front. While this was going on, the 25th Division outflanked the Japanese from the south. This attack was started after a fifteen-minute preparation of artillery, air wing and naval gunfire. The attack succeeded and by 23 January, Collins had trapped the enemy and was using artillery to neutralize them.¹¹

Collins as a new division commander had a healthy respect for artillery and knew how to doctrinally employ it. Further, his use of artillery was in conjunction with air attacks and used maneuver to take advantage of the effects of fires. He saw fires as a way to create opportunities for a ground commander to maneuver, limit casualties and isolate the enemy. It was during Guadalcanal, that Collins earned the nickname "Lightning Joe," derived from his radio call sign and his name Joseph Lawton.¹²

General Collins' ability to deploy and successfully use his artillery at Guadalcanal was not the case for the 32nd Infantry Division on the island of Buna in 1942. There, the 32nd was not allowed to deploy its artillery because MacArthur and his air commander said, "in this theater the artillery flies."¹³ Consequently, operations at Buna would suffer for lack of artillery support. Eventually, the 32nd would get its artillery and proceed to smash Japanese bunkers with direct fire from artillery, a technique that Collins would use at Cherbourg and Aachen.¹⁴

According to House, "the 32nd Division learned at great cost the need to coordinate artillery and air support with the infantry. To some extent the US troops who invaded Normandy in 1944 had to relearn this lesson."¹⁵ According to Perret, Collins' use of fire support at Guadalcanal was unique. Collins' divisional artillery was the first American unit to use the

technique of massing fires with time on targets in World War II. Also, Collins was the first commander to effectively use close air support in the war and helped to develop the use of artillery smoke rounds to designate ground targets for aircraft.¹⁶

By 8 February 1943, the Japanese evacuated their last forces from Guadalcanal.¹⁷ In December 1943, Collins went home on leave and did not know that he would never see the 25th Division again. Reassigned to European Theater of Operations (ETO), on 12 February 1944, at age forty eight, Collins took command of the US VII Corps and would be one of the few commanders at Normandy with recent combat experience.¹⁸

Collins had learned in the Pacific that the artillery must "conform to the needs of the infantry."¹⁹ Collins wanted forward observers to be competent artillerymen, not just observers, and that artillery fires should be massed within 100-200 yards of friendly infantry. Collins found his VII Corps artillery commander, Brigadier General Charles Doran, to be from the "old school." Doran believed in putting observers on OP's well behind the infantry; this was not doctrinally correct. During the 1930s, Fort Sill's new doctrine was that forward observers, called liaisons, would be attached to and move with supported infantry and armor units. This was for the purpose of eliminating wasteful barrages and permitting observers to accurately call in massed fires on a specific location. Eventually, Collins replaced Doran with Brigadier General Williston Palmer, who remained VII Corps artillery commander and corps deputy commander throughout the war.²⁰

Upon assuming command of VII Corps, Collins conducted a training preparation as he had for the 25th Infantry Division. Due to limited area in England, he was only able to train battalion level exercises, mainly focusing on his first wave division which was the 4th Infantry Division. At Slapston Sands, VII Corps was able to conduct regimental combat team training with artillery, air support and naval gunfire. After these exercises, Collins further refined the use of smoke rounds to identify targets for close air support. Finally, by 7 April 1944, each corps commander briefed their plan for D day to Eisenhower and Montgomery.²¹

According to Collins, the success of the D day invasion depended on the naval gunfire from the seventeen ships of the Navy's Task Force 123. These ships were to shoot at known locations of German batteries and strongpoints. As the landing craft approached, naval gunfire would be shifted further inland, much like the rolling barrages of World War I. However, unlike World War I barrages, this naval gunfire was intended to neutralize, not destroy, German shore batteries. This newer concept of neutralization was the economical application of enough firepower to inflict the damage necessary to prevent an enemy unit from being able to operate and conduct its mission. This compares to the effect of destruction where enough firepower is applied to kill and destroy most of an enemy unit, so that it no longer exists.²² After naval gunfire, Army artillery on landing craft would pick up the mission of close fires. As a result of this support, Utah Beach received only a few rounds of incoming German artillery.²³

Upon landing at Utah, Collins' primary concern was to get the 4th Infantry Division to Cherbourg with the 82nd Airborne Division defending his flank. In order to close the gap between the beaches, VII Corps fired a massive preparation on 12 June at 0200 hours, which according to Collins, was successful. Turning north, Collins now placed four regiments on line and was able to advance to Quinerville to secure his right flank by 14 June.

Meanwhile, the 90th Infantry Division was making poor progress through the hedgerows and was taking heavy casualties from German mortars and artillery. On 13 June, Collins went to visit the 90th Infantry Division in the field. Collins easily found the 90th's front line units, but could not find a single CP. This gave Collins the impression that the division's leadership was timid and deliberately too far from the fighting. As a result, he believed that the division lacked fighting spirit. Collins had the commanding general Major General Jay W. McKelvie, an artilleryman, replaced by a senior infantryman--General Eugene Landrum.²⁴ Further, Collins recommended that his G-3, Colonel Richard Partridge and Colonel George Barth, Chief of Staff of the 90th Division, become regimental commanders in the 90th. Both of these officers were artillerymen, and Collins thought highly of them.²⁵

In preparing his plan to capture Cherbourg, Collins believed that there were 40,000 Germans defending the port. General Collins' plan was to have three divisions attack on line: the 4th Infantry, 79th Infantry, and 9th Infantry Divisions with the 4th and 9th conducting a double pincer into Cherbourg.²⁶ The 4th Infantry Division attacked 19 June at 0300 hours with an artillery preparation, but made little progress. The port of Cherbourg as an objective became more important after 19 June when a big storm stopped supply operations at Utah Beach.²⁷

On 22 June, VII Corps executed a saturation bombing of the German defensive perimeter at Cherbourg. Before the bombing, at H-80 minutes, German antiaircraft artillery was hit by British Typhoon aircraft. Over the next hour, eleven groups of IX Bomber Command would attack "ahead of the advancing troops. Like a rolling barrage."²⁸ This bombardment dropped 1,100 tons of bombs, and, unlike future air bombardments, was intended more to demoralize German morale than to neutralize enemy forces.²⁹ Collins had the forward line of troops marked with yellow smoke, and targets were marked by white phosphorous artillery shells. Unfortunately, the Typhoons missed the yellow smoke and strafed several hundred meters in front of Collins.

Based on interrogations of German prisoners, Allied intelligence learned that the bombing shook the defenders, but the most damage was done by artillery. On the other hand, the preparation did not defeat the Germans and only limited penetrations were made. This was a lesson for Collins--to consider increasing his use of firepower.³⁰ On 24 June, three US divisions were approaching into Cherbourg from three different directions. To finish off the inner defenses, on 25 June, Naval Task Force 129, with three battleships and four cruisers, and VII Corps artillery shelled Cherbourg and destroyed German 88-millimeter guns around Cherbourg.³¹ On 26 June, VII Corps used tank destroyers in direct fire against Fort du Roule causing General von Schlieben, commander of Cherbourg, and his remaining troops to surrender. By 27 June, all of Cherbourg was secured.³²

The importance of Cherbourg, besides securing Collins' flank, was that its port facilities were capable of bringing in more logistics. As Collins had learned at the Industrial War College,

logistics was an important part of war and of artillery planning. Early on in the campaign, ammunition consumption from D day to D+5 was less than the planned rate. This was fortunate because ammunition delivery was below planned rates. Although the situation for other logistical items was good in June, ammunition was critically short. This was due more to delivery than wasteful consumption. By mid-June, ammunition, especially artillery ammunition, became a priority. This was important because the First US Army would need a sufficient supply of artillery ammunition in order to neutralize German forces and to penetrate out of the hedgerows.

On 15 June, expenditure restrictions were imposed by VII Corps. Today, this is called a controlled supply rate (CSR). One reason that rationing occurred was that units violated First US Army guidance and created stockpiles at artillery locations. Also, unloading of ammunition in late June did not occur due to the bad weather.³³ Developing the concept of a controlled supply rate was new for the US Army. The Army logistics manual Field Manual 101-10 used an ammunition category, fire units. This was a measure of fire based on tactical operations.³⁴

According to Field Manual 101-10, a 105-millimeter howitzer unit of fire was equal to 200 rounds per howitzer. For 155-millimeter howitzers, a general support weapon for division and corps, a fire unit was 150 rounds. The larger caliber, eight-inch howitzer was to receive fifty rounds per gun. These fire units were used to plan tactical ammunition consumption. A deliberate attack or defense required two fire units for the first day and one fire unit for subsequent days.³⁵ A possibility for the ammunition shortage was that the flawed prewar assumption that neutralization of targets could be accomplished with fewer shells, and that ammunition consumption in World War I was a fluke and not a historical example.

In July 1944, only 40,000 artillery rounds a day were delivered whereas First US Army wanted 90,000 artillery rounds a day.³⁶ Also, the Americans encouraged "morale firing" by new divisions. This morale firing was usually a large artillery preparation intended to motivate the US infantry before they attacked the Germans. In July, with new divisions preparing to support the upcoming OPERATION COBRA offensive, this period was the heaviest use of artillery during the

Normandy campaign. By 16 July a controlled supply rate was imposed on artillery rounds, but many commanders objected, since they felt more artillery lowered casualties.³⁷

Collins was now ordered to attack south in a frontal attack. Since there was only room for one division, the mission went to the 83rd Infantry Division. During this, the 83rd Divisional Artillery would be augmented by additional support from the entire 9th Divisional Artillery whose infantry were in reserve.³⁸ This was a proper doctrinal use of the 9th Divisional Artillery. However, the 83rd failed to reach Santeney and lost 1,400 men while fighting the German 6th Parachute Regiment. The 83rd was an inexperienced unit, and lost its communication during battle which prevented effective use of its artillery.

Next day, the veteran 4th Infantry Division was committed alongside the 83rd Infantry Division to expedite the attack. Initially, Collins split his artillery support between the 83rd and the 4th Infantry Division. Further, Collins planned a heavy bombardment by three groups of fighter bombers from 0600 to 0646 hours; however, due to rain, it was canceled. A regimental night attack by 4th Infantry Division on 6-7 July was supported by all of VII Corps artillery. After two days of fighting, the 83rd began to make better use of its artillery.³⁹ As a new corps commander, Collins was learning the necessity of massing firepower to support his divisions and weighting the main effort division or regiment with more artillery.

Because of the swampy terrain in Collins' sector, VII Corps was forced to commit costly frontal attacks to break out of the hedgerows. Collins told Bradley "that the bocage was as bad as anything he encountered on Guadalcanal."⁴⁰ According to Perret, many people believe that the Americans simply blasted their way out of Normandy with unlimited artillery. However, failure to properly plan logistically resulted in the US having to ration artillery. In the end, the burden of penetrating the hedgerows fell on the US infantry.⁴¹ In doing this, Collins had to make his artillery count and massed it whenever possible to get the best results to assist the infantry.

As in Guadalcanal, Collins used relatively short artillery preparations of ten to thirty-minutes, a practice that was not unorthodox. According to the Army's operations manual, Field

Manual 100-5, dated 1944, artillery preparations doctrinally were to last fifteen minutes to three hours.⁴² A later observation to the American use of short artillery preparations in Normandy was that of Major William Depuy. Depuy, who was in the ill-fated 90th Infantry Division, stated that he "watched them march soldiers against well-defended hedgerows after a few rounds of preparatory fire when battalions of . . . artillery should have been used to suppress the enemy."⁴³ Possibly based on the lesson of the Normandy campaign, General Collins would use longer artillery preparations during the rest of the war.

During Normandy, German soldiers learned to fear artillery time on targets. Without warning to the Germans, guns along the front would fire at a centralized grid. In a matter of seconds, soldiers standing in the open would be seriously maimed. In a war where 50 percent of total battle casualties were due to combat stress, such neutralizing fires were effective and had a psychological impact.⁴⁴

During Guadalcanal, Collins wanted his artillery to fire within 200 meters of friendly lines. This 200 meters is well within the 600 meters for the minimum safe distance for friendly artillery. This is a worthwhile point because during the war German infantry learned to hug Allied front lines. This was due to the fact that Allied artillery rounds tended not to land any closer than 300 meters to Allied front lines. This was in order to avoid having the rounds fall short and cause Allied casualties. As a result, many Allied artillery preparations, although spectacular, tended to land ineffectively behind the German front lines.⁴⁵

Early in July, Collins' VII Corps slowly advanced out of the hedgerows. On the night of 10-11 July 1944, General Fritz Bayerlein's Panzer Lehr Division counterattacked up VII Corps boundary near the Vire River, west of Saint Lo. VII Corps artillery neutralized the attacking German infantry, isolating the German tanks. During this battle, VII Corps artillery fired massed time on targets against German tank columns, while US fighter bombers were used to hit deep against rear elements of Panzer Lehr.⁴⁶ This combination of fire support, along with determined resistance on the ground by VII Corps infantry and armor stopped the Panzer Lehr counterattack.

American artillery may not have been able to win Normandy alone, but its presence prevented any successful counterattacks by the Germans. General Collins' use of artillery and air support in Normandy would be further refined and successfully used against massed German armor attacks in the Ardennes six months later.

In World War II, rolling barrages were not used as in World War I; only in one instance did the US use a rolling barrage--during 2nd Infantry Division's tenacious attack against the German 3rd Parachute Division defending Hill 192 east of Saint Lo. An infantry regiment used a rolling barrage to systematically neutralize entrenched fighting positions. Eight artillery battalions fired 3,000 rounds each with 100-meter lifts. Afterwards, captured German soldiers spoke impressively of what was probably the last rolling barrage the US shot in Northwest Europe.⁴⁷

Instead of artillery, General Bradley wanted to use saturation bombing for a breakout. A lesson learned from General Montgomery at Caen was that large bombs created tank obstacles. General Peter Quesada, the tactical air commander, recommended 250-pound bombs which are only a little bigger than heavy artillery shells. Indicative of Collins' respect for firepower, he wanted the Air Force to use 500 pounders for their shock effect. In the end, 250-pound bombs were used to minimize cratering and obstacles. On 13 July, VII Corps' outline plan was published with a saturation bombing by heavy bombers to permit a penetration by five divisions of VII Corps along the Perier Saint Lo road. The Air Force planned to use 2,200 fighters and bombers to accomplish this task.

First US Army's plan was to bomb a box 7,000 yards by 5,000 yards square. The St. Lo road was the "bomb safety line" which today would be called the fire support coordination line. The air attack would begin eighty-minutes before the infantry attack, first starting with a twenty-minute strike by 350 fighter bombers and followed by 1,800 heavy bombers. The final H hour was set for the 25th of July at 1100 hours.⁴⁸

Due to the bombers flying perpendicular to the front line of troops, some of the bombs fell short. This resulted in 601 casualties for VII Corps including General Lesley McNair,

commander of Army Ground Forces. Also, the fire direction center for the 957th Field Artillery was destroyed and the wire communications for 9th Divisional Artillery were cut. Further, one of the attacking divisions, 30th Division, reported 164 stress casualties due to short bombs.⁴⁹

With the preparation fires weighted towards air support, Collins' artillery would be relegated to a supporting role. VII Corps artillery had twenty-one battalions, 258 guns, with a total of 1,000 guns counting divisional artilleries. For ammunition, VII Corps was allotted 140,000 rounds of ammunition. This shortage of ammunition prevented Collins from utilizing all his guns to their maximum potential. As a result, only known enemy positions were targeted; suspected positions were on call. Collins had no corps fire plan and allowed divisions to plan their own preparation. This decentralized use of artillery on the offense was doctrinally correct. Also, corps artillery fired only counterbattery and counterflak, which according to the 1944 Field Manual 100-5, was the doctrinal mission of corps artillery. Further, no fires were shot beyond the German main line of resistance.⁵⁰ According to Russell Weigley, "the air plan was . . . crucial because it would have to do much of the work ordinarily expected of artillery."⁵¹

After the bombing, the infantry with artillery support attacked as planned. The 9th, 4th and 30th Infantry Divisions met heavy resistance from soldiers of the Panzer Lehr and 5th Parachute Regiment who were not caught in the bombing.⁵² By midnight, the three VII Corps' divisions had made progress. In order to maintain momentum, Collins decided to commit the 1st Infantry Division and the 2nd Armored Division.⁵³

While the US VIII Corps was fixing the 2nd SS Panzer Division to the west of VII Corps, 2nd Armored Division was to cut off German forces. At Rauncey, Germans tried to break out with vehicles bumper to bumper. General Quesada's fighter bombers and VII Corps artillery hit the vehicles.⁵⁴

In this exploitation phase, the supply of artillery ammunition for VII Corps was no longer a problem, since against retreating German forces ammunition consumption was reduced.

During the breakout, 9,000 sorties from the IX Tactical Air Force dropped 6,000 tons of bombs. Of these 9,000 sorties, 43 percent were close air support for the VII Corps armored columns. What is significant is that tactical airpower was now providing more tonnage than the artillery. Consequently, during the breakout VII Corps relied more on air support, instead of using artillery.⁵⁵

During OPERATION COBRA, air controllers were in the lead VII Corps' columns with communication developed by General Bradley and General Quesada. This system worked very well. Although Collins cannot claim credit for this, it was being implemented in his corps and parallels his earlier developments in using close air support at Guadalcanal. According to one German commander, "While bombing and artillery were decisive . . . low-flying aircraft cooperation with ground forces was exemplary."⁵⁶ This close air was the "vital and perhaps essential factor in the American success."⁵⁷ Further, this "tank-air team" was "an outstanding achievement in air-ground cooperation and represented the development of an unbeatable combination."⁵⁸ Collins would make use of this close air support system at Aachen and again during the Ardennes offensive.

With the Allies exploiting the OPERATION COBRA breakout, the Germans planned a counterattack toward Mortain. This counterattack was known by the Allies because of ULTRA. ULTRA, a British intelligence asset, was a captured German encryption device, enabling the Allies to read German secret messages. On 2 August, General Hans Gunther von Kluge ordered the 47th Panzer Corps to counterattack to Avranches to cut off the American penetration. Previously, General Collins ordered General Huebner's 1st Infantry Division to control Hill 317, key terrain of the Mortain avenue of approach. At midnight, von Funck's 47th Panzer Corps attacked VII Corps with four panzer divisions. To maintain the element of surprise, the Germans did not fire an artillery preparation. By noon, von Funck halted because his pincer in the south came under heavy artillery fire and air attack.⁵⁹

In the south, 2-120 Infantry held Hill 317 with two forward observers, 1LT Charles Barts and 2LT Robert Weiss of the 230th Field Artillery. These two forward observers called for fire on top of the 1st SS and 2nd SS Panzer Divisions, thus stopping the advancing German tanks. With reinforcements, VII Corps now had five infantry divisions and two armored divisions against four weak panzer divisions with only 200 tanks. Collins pinned down German forces in the center with his artillery, while he counterattacked in the north with the 9th Infantry Division and in the south with the 35th Infantry Division and 2nd Armored Division. The German lack of combined arms and artillery enabled VII Corps to maneuver and counterattack with impunity; whereas the Germans could not without bringing upon themselves artillery and air attack. By 12 August, VII Corps lines had stabilized, and VII Corps resumed the offense.⁶⁰

The Mortain counterattack destroyed the last tanks of the German forces in Normandy. Now greatly outnumbered, the German forces of Army Group B had no choice but to retreat out of Normandy. Surrounded on three sides, the Germans were in a pocket called the Falaise Pocket, with the escape route called the Gap. On 19 August, the US XV Corps linked up with the Polish Armored Division near Chabois; the Falaise Gap was closed. One month later, VII Corps crossed the Meuse River.⁶¹ Allied supply lines were now 500 kilometers long, resulting in a supply problem for US forces.

During the pursuit operation across France in September, Collins attached a battalion of corps artillery to each one of his divisions. Initially, during the fast pursuit across France, this was sufficient in dealing with meager German resistance. Meanwhile, the VII Corps artillery advanced by bounds through France, but was usually out of range of the retreating German lines. During the critical supply situation in September, artillery trucks were used to move supplies. In the First US Army, eighteen corps artillery battalions with 650 trucks were used to haul supplies. This can be estimated to be two-thirds of the available corps artillery, but after September 17, this practice was decreased.⁶² In late September, operations except for patrols came to a halt with the US XIX, VII, and V Corps on line along the German border. During this time, there was a chronic shortage

of 105 millimeter ammunition which precipitated strict rationing.⁶³ After a tactical pause, 1st Infantry Division attacked Aachen on 7 October.

VII Corps' sector was a 30 kilometer front with the 1st Infantry, 3rd Armored and 9th Infantry Divisions. Collins' main effort would be in the south with the 1st Infantry Division. According to the official First US Army history, this wooded terrain was rugged, especially in the Huertgen Forest area. Collins determined that this restrictive terrain required more artillery support. To compensate for the shortage of ammunition, artillery was massed at a few targets of "most critical value."⁶⁴

In the south, Collins decided that the Huertgen Forest on the VII Corps flank had to be secured and gave that mission to the 9th Infantry Division. By October 1944, First US Army was now the main effort in 12th Army Group with VII Corps being the main effort in the First US Army.⁶⁵ This meant that Collins had the highest priority for resupply of artillery ammunition in Bradley's army group and for any US corps in Northwest Europe.

On 8 October, 1944, VII Corps' 1st Infantry Division attacked Aachen from the south as part of a double envelopment with XIX Corps in the north. Collins had eleven artillery battalions fire an hour-long preparation before the attack. During the attack, 1st Infantry advanced only 1000 meters. The 18th Infantry Regiment had the mission to capture Crucifix Hill. Due to fall weather, fog prevented VII Corps artillery or air support from neutralizing any of the 200 guns belonging to the German 81st Corps. By 10 October, VII Corps had helped 1st Infantry Division to encircle Aachen.⁶⁶

During 11-13 October, 1st Infantry Division fought a tough battle against the German defenders who equaled the division in strength.⁶⁷ On 15 October, the Germans launched a hasty counterattack by the 3rd Panzer Grenadier Division to retake Crucifix Hill and relieve Aachen. Within six minutes of their main attack, VII Corps artillery with six battalions fired a massed time on target. The 3rd Grenadier Division commander observed, "It was obvious that an advance through this fire was impossible."⁶⁸ According to the official First US Army history, VII Corps

made a "liberal use of air and artillery fire, including . . . eight-inch and 240-millimeter howitzers."⁶⁹ Finally, VII Corps fired massed missions with seven battalions and a squadron of P-47s against thirty German vehicles attempting to break through. This fire support was enough to stop the 3rd Division's counterattack.⁷⁰

On October 17-19, heavy artillery fire by VII Corps stopped German armored counterattacks and defeated German counterbattery. This can be attributed to improved visibility which aided artillery air observers. Meanwhile, Collins' corps and divisional artilleries were firing 5,000 rounds a day into the city of Aachen. Previously, VII Corps fired an artillery preparation against Aachen for two days with 10,000 rounds and 160 tons of bombs. This initial preparation had little effect against the German defenders, resulting in a protracted battle in which fighting took place from "house to house and cellar to cellar."⁷¹

The 26th Infantry Regiment of the 1st Infantry had the mission of clearing Aachen. This unit was given 155-millimeter self-propelled howitzers and adopted the practice of "mouse-holing." Using 155-millimeter howitzers in direct fire, 1st Infantry Division blasted the German defensive positions. This use of mouse-holing by VII Corps was indicative of Collins' appreciation of the application of overwhelming firepower at critical points to win a battle. By 20 October, most of Aachen had been cleared by the Americans. Finally, on 21 October, 1st Infantry brought their 155-millimeter howitzers to bear on the German headquarters, resulting in the surrender of the German commander and 600 men.⁷²

During the battle for Aachen, both US VII Corps and XIX Corps artillery had a total of twenty-five artillery battalions (300 guns) and fired an average of 9,300 shells a day. The Germans had 200 guns, mostly 105-millimeter howitzers and fired an average of 4,500 shells a day.⁷³ According to VII Corps records, VII Corps "used plenty of artillery ammunition in the Aachen attack, and it had a great deal to do with our success."⁷⁴

To the south at Huertgen, supporting artillery to 9th Infantry Division was firing 5,000 rounds a day, and was receiving support from two P-47 groups. German artillery strength doubled

and began to increase US casualties. However, American artillery was able to interdict the German lines of communication in the Huertgen Forest. During the battle for the Huertgen Forest, Collins recognized the restrictive nature of the terrain, much like Guadalcanal and Normandy, and doubled the amount of artillery support he had given to the 9th Infantry Division. Despite this, a stalemate developed. Eventually, the battle for the Huertgen Forest became known as "Passchendaele with tree bursts" referring to a muddy battle of attrition in World War I.⁷⁵

On 25 October, 9th Infantry was relieved by the 28th Infantry Division.⁷⁶ 28th Infantry was to renew attacks in the Huertgen Forest to capture Schmidt on 2 November. One hour before H hour, fourteen artillery battalions fired a preparation. VII Corps artillery fired 4,000 rounds in a preliminary barrage. Fifteen minutes before the infantry attacked, 28th Divisional Artillery shifted fires to hit German front line positions. By H hour, 28th Divisional Artillery had fired 7300 rounds. Despite this support from corps and division artillery, the 28th Infantry Division advanced only two kilometers.⁷⁷ This attack on Schmidt failed and became one of the most costly battles in World War II. Further, it cost the 28th Infantry Division 6,200 casualties, thus earning it the nickname "Bloody Bucket Division."⁷⁸

To exploit Collins' capture of Aachen and cross the Rhine River, General Bradley wanted to use the air force instead of artillery for an hour long preparation. This preparation was executed on 16 November. Even though 105-millimeter howitzer ammunition was in short supply, General Bradley designated the First US Army to receive 50 percent of available artillery ammunition. It can be estimated that VII Corps received a significant part of First US Army's allocation.⁷⁹

Collins, as a new division commander on Guadalcanal, used his two direct support battalions and two general support battalions with some air support in accordance with the Army's 1941 Field Manual 100-5. At D day, Collins used extensive naval gunfire at Utah Beach, and while attacking Cherbourg, Collins relied on his corps artillery and air force to bomb, hoping to neutralize German forces. As a new corps commander trying to break out of the hedgerows, Collins learned the importance of firepower and massing fires.

The culmination of this lesson of massing fires was OPERATION COBRA. Collins adopted the use of air power to augment artillery during the OPERATION COBRA breakout and used the artillery to provide marking rounds and counterflak for the air bombardments. Also, Collins learned the importance of task organizing his artillery and weighting the main effort. Initially in Normandy, Collins split his artillery support between the 83rd Infantry Division and the 4th Infantry Division, but eventually during one attack had all his artillery support an entire infantry regiment.

During the Normandy campaign, Collins and VII Corps refined their use of artillery preparations and established the right duration, based on available ammunition. This emphasis on artillery preparations prior to a US ground attack was due to the fact that the German defenders were entrenched in the hedgerows in close proximity to US troops, who were inexperienced in close combat. This close proximity and inexperience precluded timely close fires by VII Corps. Initially, time on targets were used to mass artillery on targets behind German lines. As the campaign progressed, time on targets were used as close fires against targets of opportunity. The Vire River and Mortain counterattacks gave VII Corps practice in firing time on targets and would rely more extensively on this at Aachen and eventually, the Ardennes.

Endnotes

¹J. Lawton Collins, General, Lightning Joe: An Autobiography (Baton Rouge: Louisiana State Press, 1979), 7; and John Miller, Jr., Guadalcanal: The First Offensive (Washington: Government Printing Office, 1949), 255.

²Collins, 44-47; and Robert H. Berlin, US Army World War Two Corps Commanders: A Composite Biography (Leavenworth, Command & General Staff College, 1989), 9.

³Geoffrey Perret, There's A War To Be Won: The US Army in W.W.II (New York: Ballantine Books, 1991), 14; and Collins, 86-88.

⁴Ibid., 134, 137.

⁵Ibid., 138, 140.

⁶Ibid., 143-147.

⁷Ibid., 148.

⁸Ibid., 150; and Miller, 258.

⁹Collins, 151-155; and Miller, 262.

¹⁰Collins, 157-8.

¹¹Collins, 157-160, 163.

¹²Ibid., 157.

¹³Perret, 224.

¹⁴Perret, 226, 228; and Jonathan M. House, Toward Combined Arms Warfare: A Survey of 20th Century Tactics, Doctrine, and Organization (Fort Leavenworth: Command & General Staff College, 1984), 128.

¹⁵Ibid., 128-129.

¹⁶Perret, 234; and Miller, 264.

¹⁷Miller, 347-348.

¹⁸Collins, 174, 179.

¹⁹Ibid., 185.

²⁰Ibid.

²¹Ibid., 185-187. Note: Collins is called the best US corps commander in Europe in WW II by United States Military Academy historian Dan Bolger. What may have helped Collins' success was that his newly assigned G3- operations officer, Colonel Richard Partridge, was an artilleryman and a graduate of the prestigious German Kriegsakademie which trained Wehrmacht general staff officers. In my opinion, having an operations officer who was trained by your opponent is a unique advantage to have, especially for a corps commander in developing his combat plans.

²²Jonathan B.A. Bailey, Field Artillery and Firepower (New York: The Military Press, 1989), 16.

²³Ibid., 200; and Gordon A. Harrison, Cross-Channel Attack (Washington: Government Printing Office, 1951), 193.

²⁴Collins, 205-209.

²⁵Harrison, 402-403; and Collins, 209.

²⁶Collins, 216; and Harrison, 416-417.

²⁷Collins, 216-217; and Harrison, 423-426.

²⁸Collins, 218.

²⁹Harrison, 428.

³⁰Collins, 218-219; and Harrison, 428-429.

³¹Collins, 220-221; and Harrison, 432.

³²Collins, 222-224

³³Roland G. Ruppenthal, Logistical Support of the Armies, Volume I, May 41 to September 1944 (Washington, Government Printing Office, 1953), 445-446.

³⁴War Department, Field Manual 101-10, Staff Officers Field Manual, Organization, Technical and Logistical Data (Washington: Government Printing Office, December 1944), 245.

³⁵Ibid., 258, 296-297.

³⁶Ruppenthal, 447. Note: the precise figure was 3,000 tons delivered and 7,500 tons requested. According to Field Manual 101-10-1, 30 percent of supply tonnage is artillery ammunition, 1,000 tons and 2,500 tons respectively. With a 105-millimeter shell weighing forty pounds (fifty per ton) and a 155-millimeter shell weighing ninety-six pounds (twenty per ton), delivered ammunition and requested ammunition can be estimated to be 40,000 rounds and 90,000 rounds respectively.

³⁷Ibid.

³⁸Martin Blumenson, Breakout and Pursuit (Washington: Government Printing Office, 1961), 79-80; and Collins, 228.

³⁹Blumenson, 87; and Collins, 229-230.

⁴⁰Micheal D. Doubler, Busting the Bocage: American Combined Arms Operations in France, 6 June-31 July 1944 (Fort Leavenworth, Command & General Staff College, 1988), 21.

⁴¹Perret, 318.

⁴²War Department, Field Service Regulations, Field Manual 100-5, Operations, June 1944, 137; and May 1941, 120. Note: According to Dr. Christopher R. Gabel, "the Army's written doctrine had always lagged behind practice, ...to find the Army's doctrine for World War II, [one] should look to the 1944 edition of Field Manual 100-5, not the 1939 version." See "Doctrine: Active Defense," Combined Arms in Battle Since 1939, (Fort Leavenworth: Command & General Staff College, 1992), 92.

⁴³Robert H. Scales, Jr., editor, Certain Victory: The US Army in the Gulf War, (Washington: Government Printing Office, 1993), 11.

⁴⁴Max Hastings, Overlord: D-Day & the Battle for Normandy, (New York: Simon & Schuster, Inc., 1984), 218; and Martin Van Creveld, Fighting Power: German and US Army Performance, 1939-1945, (Westport: Greenwood Press, 1982), 95.

⁴⁵Hastings, 180.

⁴⁶Blumenson, 136-137; and Collins, 231.

⁴⁷Bailey, 206.

⁴⁸Collins, 232-239; and Blumenson, 228-229.

⁴⁹Collins, 240; and Blumenson, 236-237.

⁵⁰Russell F. Weigley, Eisenhower's Lieutenants: The Campaign of France and Germany, 1944-1945 (Bloomington: Indiana University Press, 1981), 151-152; Blumenson, 219; War Department, Field Manual 100-5, Operations, 1944, 13; and Field Manual 100-5, Operations, 1941, 9.

⁵¹Weigley, 152.

⁵²Collins, 241-242; and Blumenson, 241-243.

⁵³Collins, 243; and Blumenson, 252-254.

⁵⁴Ibid., 278-280.

⁵⁵Blumenson, 332-333.

⁵⁶Collins, 248.

⁵⁷Blumenson, 333.

⁵⁸Ibid., 334.

⁵⁹Collins, 250-251; and Blumenson, 466.

⁶⁰Collins, 252-255; and Blumenson, 488.

⁶¹Collins, 257, 264.

⁶²Elbridge Colby, The First Army In Europe (Washington: Government Printing Office, 1969), 103-104.

⁶³Charles B. MacDonald, The Siegfried Line Campaign, (Washington: Government Printing Office, 1963), 68; and Collins, 267.

⁶⁴Colby, 101,103.

⁶⁵MacDonald, 323-324; and Collins, 274.

⁶⁶MacDonald, 283-289; Weigley, 360-361; and Colby, 105-106.

⁶⁷Colby, 106.

⁶⁸MacDonald, 290-291; and Weigley, 362.

⁶⁹Colby, 107.

⁷⁰MacDonald, 292; and Weigley, 363.

⁷¹Colby, 107.

⁷²Christopher R. Gabel, "Military Operations on Urbanized Terrain: The 2nd Battalion, 26th Infantry, at Aachen, October 1944," Combined Arms in Battle Since 1939 (Fort Leavenworth, Command & General Staff College, 1992), 166; and Colby, 107.

⁷³MacDonald, 309-318; and Weigley, 363-364.

⁷⁴Colby, 108.

⁷⁵Charles B. MacDonald, The Battle of the Huertgen Forest (New York: The Berkley Publishing Group, 1963), 204.

⁷⁶MacDonald, The Siegfried Line Campaign, 332-340.

⁷⁷Ibid., 348-349; Weigley, 366; and Colby, 110.

⁷⁸MacDonald, The Siegfried Line Campaign, 373-374; and Weigley, 368.

⁷⁹Collins, 275; and Weigley, 377.

CHAPTER FOUR

DESTRUCTION: ROER TO THE ELBE

Late in 1944, General Collins, a veteran of Guadalcanal and Normandy, was now one of the most experienced corps commanders in Europe and the US Army. The VII Corps had been in heavy combat for four months, and was now attacking into Germany. During this part of the European campaign, the biggest threat to VII Corps was aggressive German counterattacks. With more available ammunition and opposed by dispersed German forces, Collins came to rely more on shooting his artillery at targets of opportunity. The tactic of massing artillery with time on targets on high value targets, such as tanks, became the technique that VII Corps would use in the upcoming battles along the Roer River and in the Ardennes Campaign.

In November 1944, First Army renewed VII Corps' attack on the Roer plain and the Huertgen Forest defended by the German 81st Corps. This preparation, dubbed OPERATION QUEEN, was the original air attack planned in October to support the Huertgen Forest attacks. On 16 November, 2,400 bombers dropped 4,100 tons of bombs on the Eschweiler-Weisweiler complex and 2,700 tons on Dueren.¹ As a result of the safety bomb line being 4,000 yards behind the German front lines, German infantry suffered only 3 percent casualties, whereas German artillery and rear units took the brunt of the bombing. Unlike the preparatory bombardment of OPERATION COBRA, OPERATION QUEEN would target German forces deep. Elements of the German 103rd Infantry Regiment were detraining at Dueren when caught by the bombing. One German sergeant said, "these kids . . . were still numb forty-five minutes after the bombardment."²

As part of the artillery preparation, General Collins gave seven 155-millimeter howitzer battalions to his four divisions.³ Under corps control, Collins had four 155-millimeter howitzer battalions and one eight-inch howitzer battalion. Also, Collins had the First US Army's 32nd FA

Brigade with three 240-millimeter howitzer battalions and two 8 inch howitzer battalions.

Altogether, Collins had ten general support battalions with the missions of providing "counterflak, counterbattery, reinforcing, and long range interdiction."⁴

In order to support his main effort, these ten battalions had the mission of providing "special attention" to the 1st Infantry Division utilizing VII Corps medium artillery. Collins assigned divisional artilleries and their attached 155-millimeter howitzer battalions with the mission of shooting the corps' counterbattery phase and would be released back to the divisions by H hour. Further, divisional artillery commanders were responsible to submit their fire plans and requests for additional fires to the "commanding general of corps artillery."⁵

At ten minutes before the bombardment hour, VII Corps fired twenty-four planned targets against ninety seven suspected German heavy antiaircraft artillery guns, which was very successful.⁶ Of the 2,000 Allied aircraft sorties, only four were shot down.⁷ If the deep destruction mission went to the air force, corps artillery now had a supporting role of counterflak. This new supporting role was the only significant change in doctrine between the 1941 and 1944 versions of Field Manual 100-5.⁸

As part of the preparation and air bombardment, VII Corps artillery planned its own sixty-minute artillery preparation, scheduled one hour before H hour.⁹ Using the artillery targeting system developed by Fort Sill in the 1930's, VII Corps planned one hundred targets: sixty targets against thirty-five suspected German 105-millimeter howitzer batteries and twenty-five suspected 150-millimeter batteries. Also, an additional forty batteries were to be hit by the air bombardment.¹⁰ According to the VII Corps G-2, the Germans had elements of three artillery regiments and an artillery brigade, at least ten battalions, facing VII Corps.¹¹

The VII Corps planned two battalion volleys on each target by one battalion. Of the total rounds fired by VII Corps, this preparation was only a fraction. Against approximately one hundred targets, it was planned for two hundred battalion volleys, or only 2,400 rounds. This twenty four rounds per enemy target is not excessive.¹² The controlled supply rate for ammunition

was based on a number rounds of “dumped at each battery location.” The 105-millimeter howitzers were to get 187 rounds per gun; 155-millimeter howitzers were to receive fifty rounds per gun, and corps’ eight-inch howitzers were to get forty rounds per gun.¹³ By World War I standards of 160,000 rounds a day, the expenditure of 40,000 rounds by VII Corps was not massive. Even by today’s standards, thirty rounds per 155-millimeter howitzer is far below the planning rate of one hundred to two hundred rounds a day.

As part of the artillery preparation plan, there were designated quiet periods for the corps’ two observation battalions to listen for German batteries. These quiet periods during the preparation are comparable to today’s queuing schedules for counterfire radar. Targets identified by sound and flash during the quiet period would be passed to VII Corps’ fire direction center.¹³ Also, during the counterflak phase, general support battalions were to have a Piper Cub in the air to adjust the preparation onto German antiaircraft artillery batteries.¹⁵

The VII Corps artillery, firing only counterbattery and counterflak, was not a deviation from doctrine. According to Field Manual 100-5, the Army’s Operations manual, corps artillery had the primary mission of shooting these missions. Divisional artilleries had the primary mission of providing close fires to maneuver forces.¹⁶ Further, Collins’ use of airpower to interdict German forces deep was not unique. Field Manual 100-5 stated that artillery was to support the attack “in depth” and that “combat aviation support the attack through the depth of the hostile position.”¹⁷

General Collins, in task organizing his artillery, gave one-half of his available 155-millimeter howitzer battalions to the divisions, permitting decentralized use and availability of his medium artillery to his division commanders. However, he maintained centralized control up to H hour, and then let the 155-millimeter howitzer battalions shoot for their divisions, and had his artillery commander review all division fire plans. This was probably to eliminate duplication of targets. He gave the 4th Infantry Division its own brigade due to its distance from the rest of corps artillery support, while maintaining support for 1st Infantry Division. Collins had a highly flexible system of command and control, where he gave his commanders enough assets to execute their

missions, while maintaining enough centralized control to influence the battle with his ten corps battalions, which were one-third of all the artillery in VII Corps.

In retrospect, General Collins' task organization for his artillery may not be that unique. Fort Sill surveys in 1942 showed that most artillerymen wanted two 155-millimeter howitzer battalions in their divisional artillery, a total of five artillery battalions. This was a direct copy of the French artillery organization. Previously, the Army had instead adopted the smaller German divisional artillery structure. However, US divisional artilleries were reinforced with artillery support from corps. General Marshall wanted small divisions which were highly mobile. In the end the Army made the right decision by keeping divisional artilleries small. This allowed for prioritization of resources and helped the US to assign artillery to divisions that were the main effort.¹⁸

The main effort for Collins' VII Corps attack on 16 November was 1st Infantry Division's attack from the town of Schevenhuetten toward the town of Hamich. In Hamich, the German defenders were in log covered emplacements which protected them from the artillery preparation. Even though the OPERATION QUEEN preparation reduced German artillery, German mortars provided a significant threat. It was discovered that most of the mortar fire holding up the 1st Infantry was directed from Hill 232. Despite attachments from 3rd Armored Division, the 1st Infantry failed to get into Hamich.¹⁹

In the north in Collins' corps, on 16 November, General Terry Allen's 104th Infantry Division attacked toward Eschweiler-Weisweiler without firing an artillery preparation. This element of surprise failed, and the 104th Infantry Division made no advance on the 16th. Realizing their mistake, the 104th Infantry Division planned an artillery preparation with air support for 17 November. The 104th Divisional Artillery fired 6,000 rounds, but failed to advance against the German 12th Division which was entrenched behind minefields and barbed wire.²⁰

On 17 November, altogether, VII Corps fired 1,660 fire missions from four divisions and one corps artillery. Of these sixteen hundred fire missions, 360 of these were preparation missions,

180 close missions, and 550 were interdiction missions. Consequently, most of the missions fired were not part of the artillery preparation. For ammunition consumption, the 4th Infantry Division fired 11,500 rounds, while 1st Infantry fired 7,100 rounds, and 3rd Armored fired 13,700. On the average, each fire mission was only a two volley of battalion fire or twenty-four rounds. Corps artillery with ten battalions fired 3,200 rounds during 161 fire missions of which thirty one were counterbattery. On average, corps' general support artillery fired thirty rounds per gun.²¹ Altogether, counting corps and divisional artilleries, VII Corps fired 41,000 rounds, which was the "largest expenditure in corps' history," and as a result, interdicted and neutralized a second echelon division, the 47th Volks Grenadier Division (VGD), which was relieving the 12th VGD.²²

During the VII Corps campaign in November 1944, the divisional artilleries fired an average one hundred fire missions and 7,500 rounds a day or approximately 2,000 rounds a day per direct support battalion.²³ Of these one hundred missions, the average was that twenty percent were preparations; twenty percent were close missions; ten to twenty percent were counterbattery missions, and thirty to forty percent were interdiction missions. The remaining percent were miscellaneous missions such as registrations. For corps artillery, VII Corps artillery with ten general support battalions focused more on counterbattery and interdiction missions, thirty percent and forty percent respectively. Also, VII Corps artillery fired 3,000 rounds a day from 120 guns, thirty rounds per 155-millimeter and eight-inch howitzer, and averaged two battalion volleys per target. This twenty four rounds per target is more indicative of neutralization fires than destruction fires.²⁴

By 17 November, the 1st Infantry had suffered several hundred casualties, seventy percent from indirect fire.²⁵ To eradicate this problem, fifteen artillery battalions fired a time on target against Hill 232. Survivors were "dazed [and] bewildered."²⁶ On the 17th, VII Corps fired 35,000 rounds. Divisions executed 139 counterbattery missions, and VII Corps artillery executed another fifty three counterbattery missions. A large number of German batteries were spotted by US

observation planes and were shelled. At night, hells in artillery interdiction were planned to listen for German artillery batteries.²⁷

Next day, 1st Infantry Division advanced two kilometers and secured Hamich and Hill 232. During the battle for Hamich, 1st Divisional Artillery fired 5,400 rounds. This compares with the fact that the German 81st Corps fired only 8,000 rounds. Indicative of American superiority in artillery, one US division was firing almost as much artillery as an entire German corps. Also, the entire US VII Corps fired a total of 41,400 rounds on 18 November which was "instrumental in breaking up" German counterattacks.²⁸

A good example of massed fires was on 19 November when a counterattack by a battalion of the 116th Panzer Division against 3-16 Infantry was stopped by fifteen artillery battalions firing a concentration with time fuses. Interrogation of captured Germans identified an assembly area for another battalion counterattack. US artillery fires were called in, disrupting the enemy battalion and reducing it to company strength. By the end of 19 November, 1st Infantry Division's four day attack advanced only three kilometers and suffered 1,000 casualties. General Collins with his main effort was hoping for a breakthrough, but instead watched it become a battle of attrition.

Significant in slowing the advance of VII Corps was the unusually high amount of artillery support received by the 81st Corps. According to General von Rundstedt, commander of Army Group B, his "defensive successes achieved . . . [were] 'to a very large extent to our artillery operations.'"²⁹ On 17 November, 81st Corps fired 13,000 artillery rounds; however, the next day this dropped to only 8,000 rounds. This number would decline day by day due to rationing for the expected Ardennes offensive.³⁰ By 22 November, the Germans, with an estimated ten artillery battalions, were firing 3,500 rounds a day.³¹ In a battle much like World War I, success became dependent upon the supply of artillery ammunition.

On 21 November, against the 1st Infantry Division near Hamich, German fires were being directed from Hill 187. General Collins thought that a time on target by only the 1st Divisional Artillery was not enough, and ordered all available VII Corps and divisional artillery units to

support this divisional time on target. After the 1st Divisional Artillery's 155-millimeter battalion adjusted onto Hill 187, adjustment corrections were transferred to the other units. Within ten minutes, the VII Corps was ready to fire. VII Corps then fired a three-minute time on target with twenty battalions on Hill 187. This was the "heaviest concentration on a single target during the war" and successfully destroyed the German observation post.³²

By 5 December, VII Corps had advanced only seven kilometers from Schevenhuetten. VII Corps was now five kilometers from the Roer River.³³ On 10 December, General Collins ordered the attack toward the Roer to resume. For corps artillery, Collins had a large force of fourteen battalions, including five battalions of self-propelled artillery. Each infantry division would now have five battalions, which was the maximum span of control.

Collins' immediate objective was the town of Dueren. Collins' G-2, Colonel Carter, estimated that most of the German's "strength was in his artillery arm." The 81st Corps now had twenty light battalions and five medium battalions, an estimated 250 guns. On 16 December, VII Corps finally reached the Roer River, an eleven kilometer advance requiring thirty one days of fighting.³⁴ With a corps numbering 100,000 combatants, Collins suffered 16,000 casualties. Total First US Army losses were 28,000 with German battle losses at 13,000; these were relatively moderate losses when compared to a World War I campaign.³⁵ Overall, 60 percent of German casualties can be attributed US artillery.³⁶

Early on, General Collins artillery preparations were ten to thirty minutes long. It was not until coming up against a fortification like the Siegfried Line did Collins resort to artillery preparations of an hour long. In analyzing General Collins' artillery tactics, it is worthwhile to study the artillery tactics of his contemporaries. General Patton, who was fighting a relative war of maneuver along the Moselle River in Lorraine, immediately started off with longer artillery preparations. For example, on 8 November 1944, XII Corps in Patton's army fired a three and one-half-hour artillery preparation.³⁷ Unlike Collins, Patton and his corps commanders were World War I veterans, so their understanding of artillery was anchored in the First World War.

General Patton, as a former corps and now an army commander, did not have the more recent tactical experience of division command as Collins did. However, even in Third Army, massed fires were not overlooked; on numerous occasions, Third Army artillery fired time on targets or concentration involving as many as thirteen battalions.³⁸

During the fight against the German 81st Corps, VII Corps for the first time in the war was faced by a relatively significant enemy artillery threat. For counterbattery tactics, "the mere presence of the planes caused a noticeable decrease in enemy artillery."³⁹ World War II would show that air interdiction and not artillery was the best counterbattery weapon. Converse to this, the Germans learned not to fire their artillery when American airplanes were sighted, thus increasing their survivability and negating American counter-battery activities.⁴⁰

In analyzing General Collins' artillery tactics it is appropriate to compare his tactics to those of the upcoming German offensive in the Ardennes. It was the Germans who first adopted Bruchmullers' short preparations of World War I. These shorter preparations were intended to bring tactical maneuver back to the World War I battlefield by neutralizing targets and maintaining some element of surprise. With the exception of Aachen, this would be the first opportunity for an entire German army group to use artillery against US forces.

In the Ardennes Campaign, December 1944, German artillery doctrine was six units of fire for an offensive operation, or 600 rounds. General Karl Thoholte, Army Group B artillery commander, wanted twelve fire units for the first ten days of the offensive--1200 rounds per gun. However, only 1.5 fire units were available, 150 rounds per gun, a total of 300,000 rounds. As a result, the controlled supply rate for the Germans was approximately thirty rounds for their 1900 guns. This compares to the 1918 Somme offensive when the Germans had 1.6 million shells for 6,000 guns to shoot a five-hour preparation. However, such levels of ammunition were not available in 1944. Overall, German planners had barely enough artillery for close support, and the vital mission of counterbattery would go unanswered. At the planning stage for the Germans, one could argue the Ardennes was already lost.⁴¹

In late 1944, both the Third US Army and the First US Army were consuming 150,000 artillery rounds a day. This was five times more than what was available to the German Army Group B which was a comparable size force. For thirty US divisions, this amounts to 5,000 rounds per division or 100 rounds per gun.⁴² In December 1944, the US artillery would fire the most 105 millimeter howitzer rounds in the entire war, 2.6 million. This left only 2.5 million rounds in stock in the entire European Theater, a mere twenty-one day supply. Despite this, 12th Army Group allowed units to freely fire 105-millimeter howitzer ammunition without restriction due to the serious nature of the German offensive, during which the weather prevented effective air support for US forces.⁴³

In comparison to Collins' use of artillery at Aachen was the German artillery tactics in the upcoming Ardennes Campaign. This German offensive offers a case study in artillery tactics, since all three German armies used a different technique of artillery support. Originally, the Germans wanted a three-hour preparation, but General Hasso Manteuffel, commander of the V Panzer Army, thought such a preparation would be ineffective and merely eliminate the element of surprise. Only one German army, the VI SS Panzer Army fired a thirty-minute preparation on 16 December 1944 at 0525 hours. World War I had taught Manteuffel that neutralization of front lines from preparations was ineffective. Proof was that US casualties from the VI SS preparation were light.⁴⁴ To compensate for the lack of artillery ammunition, V Panzer Army decided to forgo an artillery preparation. To Manteuffel's south, the VII German Army concentrated its preparation on a few targets. The VII Army's 85th Artillery Corps with six battalions fired a short preparation of ninety rounds per gun at their maximum rate of fire, the fastest rate a howitzer can be fired.⁴⁵

Indicative of US artillery superiority, the US V Corps, Collins' sister corps, defended in the north against VI SS Army's attack and was supported by twenty-seven artillery battalions, a total of 348 guns. The V Corps with an eight kilometer front, had one artillery piece for every twenty meters of frontage or forty five guns per kilometer, and was the largest concentration of US

artillery in the war.⁴⁶ For the US, "the artillery turned out to be the most effective antitank weapon of all."⁴⁷

During the Ardennes offensive, the Germans had penetrated between the US V Corps and the US VIII Corps, cutting the First US Army in half. As a result, General Bernard Montgomery, commander of the British 21st Army Group, was placed in command of all the US 12th Army Group units in the north. At this time, Collins' VII Corps was in the north at Dueren and was transferred south. Collins now commanded the 84th Infantry Division, the new 75th Infantry Division, the 2nd Armored Division and the 3rd Armored Division. VII Corps now had a 90 kilometer front from the Ourth River to Dinant. On 23 December, Collins executed his first counterattack against Manteuffel's V Panzer Army. Meanwhile, to the west, the British XXX Corps was in reserve behind Collins. Knowing the advantages of artillery, Collins had General Brian Horrocks' XXX Corps' artillery reinforce VII Corps artillery.

During his counterattack, Collins had General Maurice Rose's 3rd Armored Division, which unlike the 2nd Armored Division, was a light armored division. Collins gave General Rose two regimental combat teams and two battalions of heavy corps artillery.⁴⁸ On 24 December, artillery air observers found the 2nd Panzer Division at the Meuse River and called in massed artillery. When the Panzer Lehr Division advanced forward to the Meuse, it was taken under by the same heavy American artillery fire which slowed down its advance.⁴⁹

On 25 December, General Ernest Harmon's 2nd Armored Division counterattacked toward Celles as planned by Collins. At 1200 hours, a US observation plane spotted seven German tanks north of Celles and destroyed them with artillery. As a result, a planned counterattack by 2nd Panzer never occurred due to this intense fire and was forced back, abandoning its three artillery battalions.⁵⁰

To reinforce the 47th Panzer Corps against Collins, the Germans committed the veteran 9th Panzer Division. 2nd Armored Division now received reports of German tanks, elements of 9th Panzer, on the road to Humaine. Against these tanks, a VII Corps time on target was

coordinated with all 155-millimeter and eight-inch howitzers in range. Even though this massed artillery did not stop these tanks, it succeeded in neutralizing the accompanying mechanized infantry. During the night, heavy artillery drove the Panther battalion out of Humaine. Next day, as a grand finale to 9th Panzer's fight, US observation planes directed an estimated thirty fighter bombers against 9th Panzer's tanks.⁵¹ For a loss of twenty-two tanks, 2nd Armored Division counted eighty two destroyed German tanks and four hundred and forty German vehicles. This one sided-fight can be attributed to "the lack of a strong German artillery . . . and the complete absence of German attack planes."⁵²

Meanwhile in the northern part of VII Corps, General Bolling's 84th Infantry Division was defending against the 116th Panzer Division and the Fuehrer Begleit Brigade. The 84th Division, with the 333rd Infantry Regiment in contact, used a 155-millimeter battalion and eight-inch battalion to defeat the German tanks. At 1830 hours, an attack by the 116th Panzer across open ground lost six tanks and was stopped by 2,000 rounds fired by the 326th FA battalion.⁵³

According to veterans of the 333rd Infantry:

[We] patched through to the artillery fire direction center and gave them the map coordinates . . . one battery would be firing to range in on the German positions. Four shells whistled in . . . precisely on target. The artillery . . . would be firing a time on target . . . the more distant cannon would fire first, so that all the shells would land . . . within seconds of each other. The shells landed simultaneously, on the line of German armor. How long it lasted, we could only guess--probably no more than five minutes, but it seemed endless. It was the heaviest, most devastating bombardment we had ever witnessed. When the fire stopped, the cries from wounded and dying Germans carried clearly to our lines.⁵⁴

By 28 December, VII Corps had stopped V Panzer Army's advance. Collins credited fighter bombers and artillery in being decisive against the German panzer divisions. During daylight, American aircraft harassed German artillery, further reducing German artillery support.⁵⁵ On 3 January 1945, VII Corps was now given the mission of cutting off the bulge and attacking toward Houffalize. Collins had twelve corps artillery battalions supporting him. On an average day his entire corps fired 19,000 rounds. However, indicative of the decentralized nature, most of these rounds were fired by divisional artillery units.

As part of the attack, an air preparation was planned at 0830 hours, but was canceled due to weather. Collins canceled the artillery preparation and achieved tactical surprise over the Germans who were not expecting an American counterattack without air or artillery support. During the next few days, to make up for the lack of air support, corps artillery and eight-inch howitzers provided fires to the divisions. VII Corps' biggest threat now was German infantry armed with shoulder fired antitank rockets, called Panzerfausts. These well armed German infantrymen were using Belgian towns as defensive strongpoints. As a result, VII Corps fired eight-inch artillery into buildings to defeat German infantry. Possibly, based on VII Corps' experience at Cherbourg and Aachen, Collins knew how to use artillery in built-up areas and his progress was not impeded by such combat.

On 17 January, 1945, 2nd Armored Division and the 11th Armored Division linked up at Houffalize. By 28 January, the Battle of the Bulge was over.⁵⁶ The Ardennes campaign is heralded as the largest battle in US Army's history. During this campaign, two US Armies altogether had six corps, twenty-eight divisions and twenty field artillery groups (brigades), a total of 183 artillery battalions or 2196 guns.⁵⁷

While the average US corps on the defense in the Ardennes had four battalions under corps control, General Collins had twelve battalions under his control, giving him more firepower to influence the battle. After VII Corps transitioned to the offensive in January, Collins assigned approximately half of his artillery to his four divisions, as he did at Aachen. This use of the artillery, centralized on the defense and decentralized on the offense, was according to the established doctrine of Field Manual 100-5.⁵⁸ This indicates that Collins aggressively employed his artillery in accordance with doctrine. As a veteran commander and a graduate of Fort Sill, Collins as a corps commander had a unique appreciation for his artillery. The fact that other US corps commanders used four artillery battalions, and Collins used twelve artillery battalions is proof. American commanders using artillery to win in World War II was not unique. What is

unique about Collins was that as a corps commander he had mastered the art of massing and getting the best possible results from his artillery

In evaluating Collins' use of artillery against the Germans, it would be relevant to judge the efficiency of the German artillery, and how it may have contributed to Collins' success. German artillery doctrine was similar to US doctrine, except that the German artillery had battery commanders control fire versus battalion fire direction centers. This difference allowed American fire direction centers to mass concentrated fires. Equipment-wise, the US artillery had more radios and artillery ammunition. There are many reasons why the Germans artillery support failed during the Ardennes offensive. In the end, the weaknesses of German artillery were more to transportation and ammunition shortages than to doctrinal deficiencies.⁵⁹

During the Ardennes campaign, German artillery officers estimated the US artillery superiority was ten to one. This is somewhat high due to the fact that US artillery fired only four times more rounds than German artillery. Overall, German commanders rated American artillery very good for technical quality, but believed that most artillery fires were wasteful and excessive. However, the 1.2 million rounds the Americans fired in December is the same number General Thoholte had originally requested for the German offensive. In the end, the Ardennes Offensive failed because "just as in 1918...the attacker had driven the defense back upon its artillery base of fire, meanwhile progressively losing his own firepower."⁶⁰

In the end, US artillery in the Ardennes Campaign was a decisive combat multiplier determining the difference between victory and defeat. According to General William E. Depuy, "based on my experience . . . the combat power provided by the artillery . . . represented 90 percent or more of the [total] combat power . . . That's why I say that getting a forward observer to a high piece of ground was the most important function [of the] infantry."⁶¹

It is no coincidence that the only rolling-barrage in Northwest Europe was fired by 2nd Infantry Division, a regular army unit with World War I veterans. Overall, the US Army never reverted back to barrages even though the British did under General Montgomery.⁶² Collins and

US forces in Northwest Europe could have easily reverted back to such tactics, but the US Army chose not to. The reason for this was the training and the importance Fort Sill placed on developing and teaching the new doctrine of fire direction centers and the new tactic of time on targets in the 1930s.

After inflicting 100,000-plus German casualties and destroying 800 German tanks in the Ardennes, the advance across the Rhine continued for the Allies and General Collins' VII Corps. The next mission for Collins was the attack on Dueren in the north. On 23 February, 1945, VII Corps attacked across the Roer River. German artillery hindered the crossing, since counterfire and air support failed to destroy German artillery. As a result, bridges were not across the Roer until nightfall from which VII Corps break out and captured Cologne on 7 March. Using III Corps bridges, VII Corps crossed the Rhine River on 16 March. During this the priority for Collins was to get his corps artillery across the river. In the pursuit across Germany in 1945, Collins would use overwhelming firepower to expedite VII Corps' offensive into the heart of Germany.

One week later, on 25 March, First US Army attacked toward Marburg and Giessen. VII Corps now became the First Army's main effort and would envelop the Ruhr pocket from the south.⁶³ By 31 March, the Ruhr pocket was completely closed, and on 5 April, VII Corps turned east toward Berlin. First Army now had the mission to attack toward Leipzig and link up with the Red Army.⁶⁴ Two weeks later, on 7 May 1945, General Wilhelm Keitel officially surrendered German forces at Eisenhower's headquarters.⁶⁵

It was a cadre of US artillerymen who developed the American artillery doctrine of WW II. Likewise, it was a small cadre of army leadership like Collins who implemented that doctrine. Fortunately, for the US Army, it had commanders like Collins who understood the benefits of time on targets and massed fires in conjunction with air support. Collins was an

aggressive commander . . . [who] worked his battalions hard . . . drove forward on narrow fronts, changing the leading formations several times in a day. He was basically a tough but flexible professional soldier . . . [who] continued to command VII Corps [in] the same fast moving style right up to the final battles in Germany.⁶⁶

By 1945, Collins had been commanding VII Corps in combat for almost a year. While Collins followed Army doctrine to use his artillery and air support, his tactics evolved over time based on the situation. At Guadalcanal, Collins used fifteen minute artillery preparations, but used longer preparations during OPERATION COBRA and OPERATION QUEEN. This was based on the enemy threat and availability of ammunition. However, as the war progressed the majority of Collins' artillery was fired at division level targets of opportunity. When Collins massed his corps artillery it was to support his main effort, such as the case of twenty battalions firing on an enemy observation post. Also, a significant number of corps' artillery missions were counter-battery. Fortunately for Collins, he was fighting an enemy with limited artillery which allowed him to assign half of his corps artillery to his divisions.

Compared to General Patton's Third Army, Collins' VII Corps fired shorter preparations, used twice as many battalions on corps time on targets and used four times more corps artillery on the defense. Except for OPERATION COBRA, Collins' artillery never produced a massive penetration, especially against the Germans entrenched on the Siegfried Line. However, when German Army Group B attacked in December 1944, and came into the open with thirty divisions, the Germans found themselves up against US corps commanders like Collins who knew how to mass their artillery and air support against targets of opportunity such as German tanks and infantry. Massed artillery time on targets which occurred on the Vire River and at Mortain were rehearsals for the destruction of Manteuffel's V Panzer Army in the Ardennes.

Endnotes

¹Charles B. MacDonald, The Siegfried Line Campaign (Washington: Government Printing Office, 1963), 408-413; Elbridge Colby, The First Army In Europe (Washington: Government Printing Office, 1969), 112; and VII Corps, Headquarters, History of VII Corps, Vol. 6, Part I, 1-30 November 1944, 29.

²MacDonald., 414.

³US VII Corps, Headquarters, Field Order No.12, Vol. 6, Part 3, dated 8 Nov 1944, 1-3.

⁴Ibid., Field Order No. 12, Annex 3, Artillery, Vol. 6, Part 3, dated 8 Nov 1944, 1.

⁵Ibid., 2.

⁶Ibid., Field Order No. 12, Annex 3, Appendix 1, Counterflak, Vol. 6, Part 3, dated 8 Nov 1944.

⁷Colby, 113.

⁸War Deptment, Service Regulations, Field Manual 100-5, Operations, May 1941, 10; and Field Manual 100-5, Operations, June 1944, 13.

⁹US VII Corps, Headquarters, Field Order No.12, Annex 3 1-3.

¹⁰Ibid., Field Order No.12, Annex 3, Appendix 2, [Artillery] Preparation, Vol. 6, Part 3, dated 8 Nov 1944.

¹¹Ibid., Field Order No.12, Annex 2, Intelligence, Vol. 6, Part 3, dated 8 Nov 1944.

¹²Ibid., Field Order No. 12, Appendix 2.

¹³Ibid.,Field Order No. 12, Annex 3, 2.

¹⁴Ibid., Field Order No. 12, Appendix 2.

¹⁵Ibid., Field Order No. 12, Appendix 1.

¹⁶War Department, Service Regulations, Field Manual 100-5, Operations, May 1941, 10; and Field Manual 100-5, Operations, June 1944, 13

¹⁷Ibid., 141.

¹⁸Perret, 83; and Bruce I. Gudmundsson, On Artillery (Westport: Praeger Publishers, 1993), 138.

¹⁹Colby, 113; and MacDonald, 415-417.

²⁰MacDonald, 419-427.

²¹US VII Corps, Headquarters, History of VII Corps, 29, 34-35.

²²Ibid., 29.

²³Ibid., 39, 46; and MacDonald, 414.

²⁴US VII Corps, Headquarters, History of VII Corps, 6-10, 39, 46.

²⁵Colby, 113; and MacDonald, 415-417.

²⁶Colby, 113; and MacDonald, 418.

²⁷US VII Corps, Headquarters, History of VII Corps, 30.

²⁸Ibid., 440; and Colby 113.

²⁹MacDonald., 427.

³⁰Ibid.

³¹Ibid., 444.

³²J. Lawton Collins, Lightning Joe: An Autobiography (Baton Rouge: Louisiana State Press, 1979), 275; and MacDonald, 481.

³³MacDonald, 492.

³⁴Ibid., 582, 593.

³⁵Note: Despite ammunition shortages, Collins VII Corps fired 259,000 artillery rounds from 1-16 December. MacDonald, 594.

³⁶Jonathan B.A. Bailey, Field Artillery and Firepower (New York: The Military Press, 1989), 5.

³⁷Hugh M. Cole, The Lorraine Campaign (Washington: Government Printing Office, 1950), 286; and Joseph Balkoski, "Patton's Third Army: The Lorraine Campaign, 19 September-1 December 1944," The War Against Hitler: Military Strategy in the West (Conshohocken, PA: Combined Books Inc., 1995), 194.

³⁸Cole, 160.

³⁹MacDonald, 450.

⁴⁰Roy R. Stephenson, "The Impact of Massive Artillery Fires On Command, Control, and Communications in the European and North African Theaters During World War Two,"

CSI Report Number 13, Tactical Responses To Concentrated Artillery (Fort Leavenworth: Command and General Staff College, 1990), 67.

⁴¹Hugh M. Cole, The Ardennes: Battle of the Bulge (Washington: Government Printing Office, 1965), 73, 656.

⁴²*Ibid.* 663-664, 151; and Bailey, 28, 206.

⁴³Russell F. Weigley, Eisenhower's Lieutenants: The Campaign of France and Germany, 1944-1945 (Bloomington: Indiana University Press, 1981), 567-568.

⁴⁴Cole, The Ardennes: Battle of The Bulge, 73, 656.

⁴⁵*Ibid.*, 656-657.

⁴⁶Charles B. MacDonald, A Time For Trumpets, 393, 409.

⁴⁷*Ibid.*, 411.

⁴⁸Charles B. MacDonald, The Last Offensive (Washington: Government Printing Office, 1973), 130; and Collins, 282- 286.

⁴⁹Parker, 253-254.

⁵⁰Cole, The Ardennes: Battle of the Bulge, 566-570.

⁵¹*Ibid.*, 571-573.

⁵²*Ibid.*, 574.

⁵³*Ibid.*, 574-576.

⁵⁴Harold P. Leinbaugh and John D. Campbell, The Men of Company K (New York: William Morrow and Company, Inc., 1985), 148-149.

⁵⁵Collins, 290-291; and Parker, 255.

⁵⁶Charles B. MacDonald, The Last Offensive, 31; Collins, 292-294; and VII Corps Artillery Headquarters, After Action Review, dated 3 FEB 1945, 3 (CARL 12298).

⁵⁷Charles B. MacDonald, A Time For Trumpets, 630-641.

⁵⁸*Ibid.*; Field Manual 100-5, Operations, 1941, 8.

⁵⁹Charles B. MacDonald, The Last Offensive, 12; and Siegfried Knappe, Soldat (New York: Dell Publishing, 1992), 204.

⁶⁰Cole, The Ardennes: Battle of the Bulge, 659.

⁶¹Danny S. Parker, Battle of the Bulge: Hitler's Ardennes Offensive, 1944-45 (Philadelphia, Combined Books, 1991), 256.

⁶²Note: During Montgomery's crossing of the Rhine on 24 March dubbed OPERATION PLUNDER, XVI US Corps had fifty-four artillery battalions fire a one hour preparation at 0100 hours. In one hour, 2100 guns fired 65,000 rounds. Weigley, 644-645.

⁶³Collins, 299-311; and Colby, 154.

⁶⁴Collins., 316-319.

⁶⁵Ibid., 326-328.

⁶⁶David Mason, Who's Who in World War Two, (Boston: Little, Brown and Company, 1978), 75-76.

CHAPTER FIVE

CONCLUSION

The fundamental principles of artillery doctrine from World War I did not change in World War II, but the tactics did change. In World War II, most of the American artillery was fired at divisional level for targets of opportunity. The doctrinal requirement of firing an artillery preparation consumed only a fraction of total ammunition consumption. Based on the evolution of technology, the air force now received part of the doctrinal preparation mission, and artillery focused more on close fires. During World War II, there was less emphasis on the third doctrinal requirement of counterbattery due to German weakness in artillery. If artillery consumption changed during the war, so did targeting. Based on OPERATION COBRA and OPERATION QUEEN, deep targets and heavy bombardments would become the mission of the tactical air force, although begrudgingly.¹ The week-long bombardments of World War I were now replaced by an hour-long bombardment by heavy bombers. The artillery now had the primary doctrinal missions of close fires and counterflak.

As the war progressed, the tactic of attacking without a doctrinal artillery preparation was tried. This was intended to maintain the element of surprise and to allow tactical maneuver. However, such tactics worked only against weak defenders or hasty defenses. In a situation like Eschweiler, where the US 104th Infantry Division attacked the entrenched German 12th Volks Grenadier Division, foregoing the artillery preparation did not work. In the end, doctrinal artillery preparations were needed against deliberate defenses to suppress and neutralize enemy forces.

During World War II, the US had the advantage of fighting an enemy who did not rely on artillery. The Germans relied more on maneuver than on the effects of indirect fires, and their use of artillery was dwarfed by the Allies. In Poland in 1939, the Germans fired 1.4 million shells in

one month, versus the US firing an average of 4.5 million shells a month during the Northwest Europe campaign.² Also, German logisticians planned only 100 rounds a day per gun versus the US planning rate of 200 rounds a day per gun. Further, a German corps had only one brigade of corps artillery, whereas the average US corps in World War II had four brigades of artillery. Based on these numbers, it is fair to assume that the US relied more on artillery in World War II.

The American artillery tactic was to fire most of its ammunition in massed time on targets against targets of opportunity. This was especially effective against the Germans whose primary defensive tactic was the local counterattack as preached by the German Truppenfuhrung, their equivalent of Field Manual 100-5, Operations.³ According to General F.W. von Mellenthin, American artillery time on targets were more effective than massive Russian artillery preparations.⁴

Total lethality of artillery in World War II was no greater than that of World War I, but better command and control made it more lethal in neutralizing German forces. The new doctrine of World War II was that forward observers would be with the ground units, while the fire direction centers computed data. Gone were the days of the battery commander calculating data from an observation post. Further, the use artillery preparations to neutralize the enemy were now augmented by time on targets against targets of opportunity which proved more effective. These time on targets were decisive in defeating German counterattacks. Artillery would now neutralize escorting infantry and finally, if need be, artillery would mass on tanks. A lesson of World War II was that artillery could defeat armor.⁵

This use of American artillery was further decisive when used in conjunction with air support. Collins was credited with developing the technique of using artillery smoke rounds with close air support in Guadalcanal. Although the Germans had used JU-87 Stukas in lieu of artillery at the Meuse in 1940, Guadalcanal was the first time the US Army had used air support for the close battle.⁶ It was this use of airpower in the close role that Collins would take to US VII Corps in the Normandy Campaign. Collins would also devise the use of counterflak fires for artillery and marking rounds for close air support. In Normandy, Collins would use air support at Cherbourg

and during the Cobra breakout. Further, air support would be effectively used by Collins against Panzer Lehr's counterattack up the Vire River on 11 July and against the 47th Panzer Corps attack on 7 August.

One of the lessons from studying General Collins as a division and corps commander was the importance he placed on training the artillery with their supported infantry, especially in live firing. This training was a basis for his success in Guadalcanal and with the 4th Infantry Division in Normandy. As the war progressed, combat in itself became training, so that by late 1944, VII Corps was routinely calling artillery and close air support in a matter of minutes in close proximity to US troops. During the Normandy Campaign, VII Corps perfected the use of time on targets during the Vire and Mortain counterattacks and would effectively employ these against German forces during Aachen and the Ardennes Campaign. In the area of fire support coordination, Collins was able to integrate artillery fires from XIX Corps and V Corps and to clear fires across an entire First US Army front.⁷ By January 1945, having fought in Normandy, Aachen and the Ardennes, VII Corps and its artillery had become a highly effective organization.

According to Collins, commenting on forward observers and the artillery in World War II:

We wanted the best artillerymen . . . to be up there with the front line . . . to know what was going on and to adjust fire there. That became the system. I wasn't responsible for it. It was something developed out of logic, and I was simply one of many people that contributed. The other thing about our artillery . . . and Sill deserves the credit for this, was the development of the system to mass fires. The Germans . . . never did really learn how to handle artillery. This may be shocking . . . But, it's a fact. We knew so much more about artillery than the Germans did, it was a tremendous advantage. At one time, I massed twenty-two battalions on one target. So you had to make an analysis of where the critical fight was going to be, then mass your artillery to help The infantry is no good without good artillery and without good air. Just can't get anywhere.⁸

What is the overarching lesson of General Collins and artillery tactics in World War II? Collins followed doctrine and used a common sense approach, emphasizing simplicity and flexibility. With the exception of developing tactics for white phosphorous rounds with close air support, he did not change doctrine, but implemented doctrine based on the tactical situation. Over

time, Collins preparations went from fifteen-minutes to one-hour and air support went from thirty airplanes to two thousand heavy bombers; his success was massing his artillery and employing time on targets at the right time and place. Overall, Lawton Collins was a technically and tactically proficient officer who understood doctrine from his prewar training at Fort Benning, Fort Sill and Fort Leavenworth and was able to employ this knowledge using his aggressive and energetic leadership style. According to historian Daniel Bolger, Lawton Collins “was clearly the best corps general” in World War II.⁹

General Collins’ success was a result of the Artillery School developing its doctrine in the 1930’s, and adopting the new doctrine of fire direction centers and the new tactic of time on targets. The tactics of World War II, short preparations and time on targets, were different than the tactics of World War I. Using shorter preparations, massed fires, firing counterflak and counterbattery are similar to today’s artillery tactics. During World War II, corps artillery used its general support artillery with target acquisition and air support to neutralize German artillery. This is similar to today’s doctrinal use of multiple launch rocket systems and TPQ-37 counterfire radars.

Massing fires and shooting thousands of rounds in counterfire, respectively, are now lessons learned from the National Training Center (NTC) and the Battle Command Training Program (BCTP). Yet, if one examines VII Corps artillery tactics during the eleven months of combat in 1944-1945, these observations are not new. Artillery tactics in World War II are the foundation for today’s artillery tactics.

Endnotes

¹Geoffrey Perret, There's A War To Be Won: The United States Army in World War Two (New York: Ballantine Publishers, 1993), 324.

²Paul H. Herbert, Deciding What Has to Be Done: General William E. Depuy and the 1976 Edition of Field Manual 100-5, Operations (Fort Leavenworth: Command & General Staff College, 1988) 15; Jonathan B. A. Bailey, Field Artillery and Firepower (New York: The Military Press, 1989), 260; and John Ellis, Brute Force, Allied Strategy and Tactics in the Second World War (New York: Viking Press, 1990), 536.

³Martin Van Creveld, Fighting Power, German U.S. Army Performance, 1939-1945 (Westport: Greenwood Press, 1982), 28-30; and Timothy A. Wray, Standing Fast: German Defensive Doctrine on the Russian Front During World War II (Fort Leavenworth: Command & General Staff College, 1986), 174-175.

⁴F. W. von Mellenthin, Panzer Battles: A Study of the Employment of Armor in the Second World War (Norman: University of Oklahoma Press, 1956), 300.

⁵Bailey, 206

⁶Jonathan M. House, Toward Combined Arms Warfare: A Survey of 20th Century Tactics, Doctrine, and Organization (Fort Leavenworth: Command & General Staff College, 1984), 86.

⁷Headquarters, US VII Corps, "VII Corps History," Volume 6, Part 3, October 1944, 80; Note: It took VII Corps less than 30 minutes to clear and fire counterfire targets across corps boundaries in October 1944; this is equal to the time it took VII Corps to clear counterfires with XVIII Airborne Corps during Operation Desert Storm. See: Certain Victory: The Gulf US Army in the Gulf War by Robert Scales, Jr., 299.

⁸Gary Wade, ed., Combat Studies Report Number 5: Conversations with General J. Lawton Collins (Fort Leavenworth: Command & General Staff College, 1991), 4-5.

⁹Daniel Bolger, "Zero Defects: Command Climate in First US Army, 1944-1945," Military Review (May 1991): 69.



Figure 1. 105 Millimeter Howitzer. Source: Pictorial Record: The War Against Germany: Europe and Adjacent Areas. Washington: Government Printing Office, 1951. 42

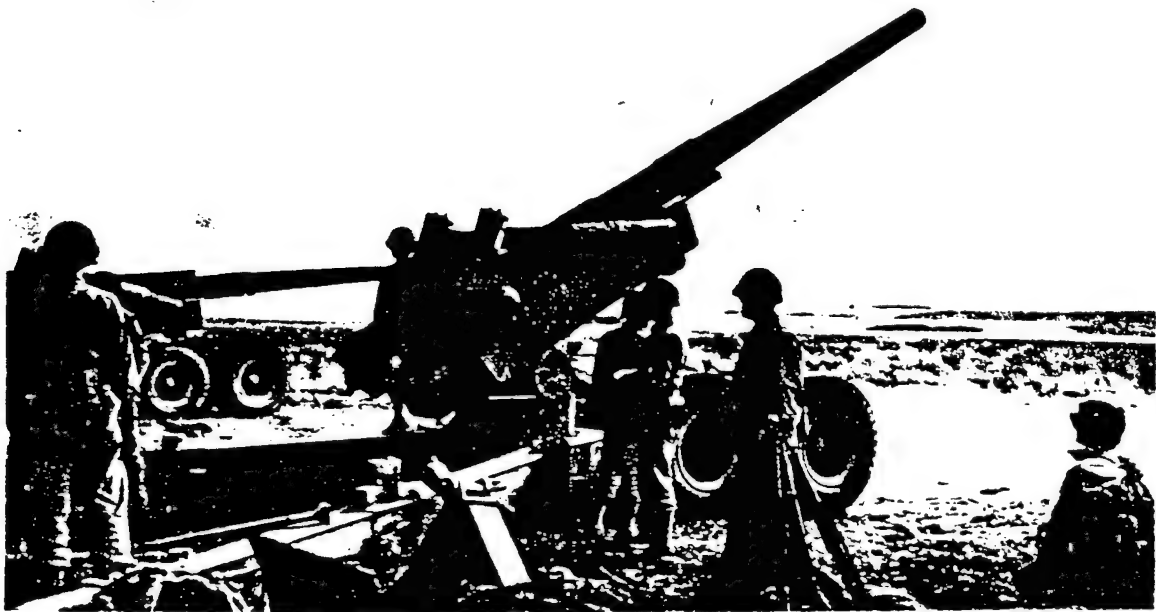


Figure 2. 155 Millimeter Field Gun. Source: Pictorial Record: The War Against Germany: Europe and Adjacent Areas. Washington: Government Printing Office, 1951. 42

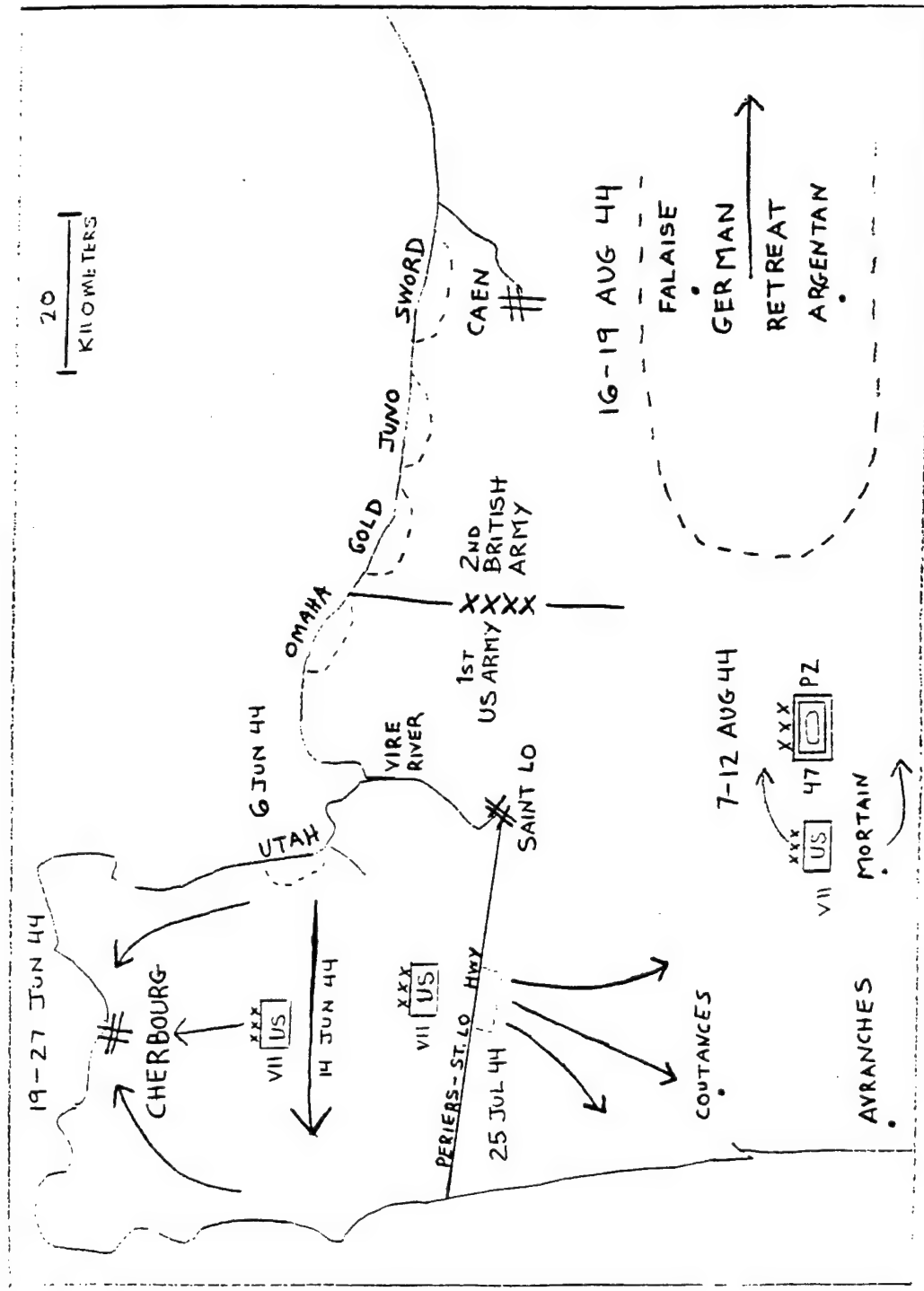


Figure 3. VII Corps Normandy Campaign. Source: Max Hastings, Overlord: D-Day and the Battle for Normandy. New York: Simon & Schuster Inc., 1984.

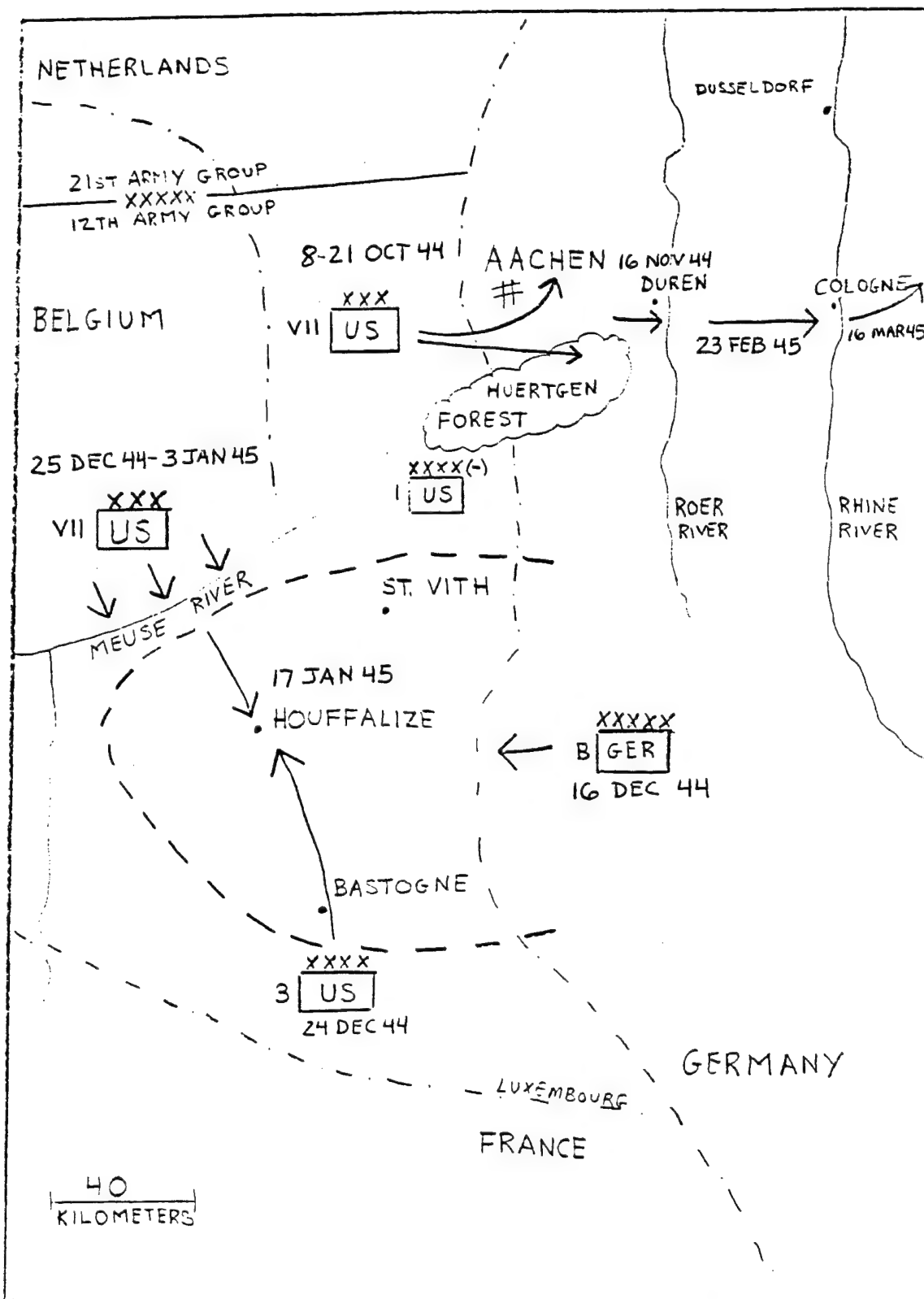


Figure 4. VII Corps October 1944-March 1945. Source: Charles B. MacDonald, The Siegfried Line Campaign. Washington: Government Printing Office, 1963. Map 9.

BIBLIOGRAPHY

Unpublished Documents

- US VII Corps, Headquarters, Field Order No. 12, Vol. 6, Part 3, 8 November 1944.
- US VII Corps Headquarters, Field Order No. 12, Annex 2, Intelligence, Vol. 6, Part 3, 8 November 1944.
- US VII Corps, Headquarters, Field Order No. 12, Annex 3, Artillery, Vol. 6, Part 3, 8 November 1944.
- US VII Corps, Headquarters, Field Order No. 12, Annex 3, Appendix 1, Counterflak, Vol. 6 Part 3, 8 November 1944.
- US VII Corps, Headquarters, Field Order No. 12, Appendix 2, [Artillery] Preparation, Vol. 6 Part 3, 8 November 1944.
- US VII Corps, Headquarters, History of VII Corps, Vol. 6, Part 3, October 1944.
- US VII Corps Headquarters, History of VII Corps, Vol. 6, Part I, November 1944.
- US VII Corps Artillery, Headquarters, After Action Review, dated 3 February 1945, CARL 12298.

Government Documents

- Berlin, Robert H., Dr. US Army World War Two Corps Commanders: A Composite Biography. Fort Leavenworth: Command & General Staff College, 1989.
- Department of the Army, Headquarters. Field Manual 100-5, Operations. Washington: Government Printing Office, 1993.
- Doubler, Micheal D. Busting the Bocage: American Combined Arms Operations in France, 6 June -31 July 1944. Fort Leavenworth: Command & General Staff College, 1988.
- Gabel, Christopher R., Dr. "Military Operations on Urbanized Terrain: The 2nd battalion, 26th Infantry, at Aachen, October 1944." Combined Arms in Battle Since 1939. Fort Leavenworth: Command & General Staff College, 1992.
- Herbert, Paul H. Deciding What Has to Be Done: General William E. Depuy and the 1976 Edition of FM 100-5, Operations. Fort Leavenworth: Command & General Staff College, 1988.

- House, Jonathan M. Toward Combined Arms Warfare: A survey of 20th Century Tactics, Doctrine, and Organization, Fort Leavenworth: Command & General Staff College, 1984.
- Lupfer, Timothy T. The Dynamics of Doctrine: The Changes in German Tactical Doctrine During the First World War. Fort Leavenworth: Command & General Staff College, 1981.
- Stephenson, Roy R., Lieutenant Colonel. "The Impact of Massive Fires on Command, Control, and Communications in the European and North African Theaters During World War Two." Combat Studies Institute Report Number 13: Tactical Responses To Concentrated Artillery. Fort Leavenworth: Command & General Staff College, 1990.
- Swain, Richard M., Colonel, Selected Papers of General William E. Depuy. Fort Leavenworth: Command & General Staff College, 1994.
- Wade, Gary, Major, ed. Combat Studies Report Number 5, Conversations With General J. Lawton Collins. Fort Leavenworth: Command & General Staff College, 1991.
- War Department. Digest of Field Artillery Developments, 1935. Fort Sill: Field Artillery Printing Plant, 1936.
- _____. Digest of Field Artillery Developments, 1936. Fort Sill: Field Artillery Printing Plant, 1936.
- _____. Digest of Field Artillery Developments, 1937. Fort Sill: Field Artillery Printing Plant, 1937.
- _____. Field Service Regulations, Field Manual 100-5, Operations. Washington: Government Printing Office, May 1941.
- _____. Field Service Regulations, Field Manual 100-5, Operations. Washington: Government Printing Office, June 1944.
- _____. Field Manual 101-10, Staff Officers Field Manual, Organizations, Technical and Logistical Data. Washington: Government Printing Office, December 1944.
- Wray, Timothy A. Standing Fast: German Defensive Doctrine on the Russian Front During World War II. Fort Leavenworth: Command & General Staff College, 1986.

Periodicals

- Bolger, Daniel. "Zero Defects: Command Climate in First US Army, 1944-45." Military Review, 71, (May 1991): 61-73.
- Nenniger, Timothy K. "Tactical Dysfunction In the A.E. F., 1917-1918." Military Review, 51, number 4, (October, 1987): 177-181.

Books

- Bailey, J. B. A., Field Artillery and Firepower. New York: Oxford Press, 1987.
- Balkoski, Joseph. "Patton's Third Army: The Lorraine Campaign, 19 September-1 December 1944." The War Against Hitler: Military Strategy in the West. Conshohocken, PA: Combined Books, Inc., 1995.
- Blumenson, Martin. Breakout and Pursuit. Washington: Government Printing Office, 1961.
- Colby, Elbridge. The First Army In Europe. Washington: Government Printing Office, 1969.
- Cole, Hugh M. The Ardennes: Battle of the Bulge. Washington: Government Printing Office, 1965.
- _____. The Lorraine Campaign. Washington: Government Printing Office, 1950.
- Collins, J. Lawton, General. Lightning Joe: An Autobiography. Baton Rouge: Louisiana State University Press, 1979.
- Ellis, John. Brute Force: Allied Strategy and Tactics in the Second World War. New York: Viking Press, 1990.
- Graham, Dominick and Shelford Bidwell. Tug of War. The Battle For Italy: 1943-45. New York: St. Martin's Press, 1986.
- Griffith, Paddy. Battle Tactics of the Western Front: The British Army's Art of Attack 1916-1918. New Haven: Yale University Press, 1994.
- Gudmundson, Bruce I. On Artillery. Westport: Praeger Publishers, 1993.
- Harrison, Gordon A. Cross-Channel Attack. Washington: Government Printing Office, 1951.
- Hastings, Max. Overlord: D-Day & the Battle for Normandy. New York: Simon & Schuster Inc., 1984.
- Keegan, John. The Face of Battle. New York: Vintage Books, 1976.
- Knappe, Siegfried, Major General. Soldat. New York: Dell Publishing, 1992.
- Lanham, C. T., and Edwin F. Harding. Infantry In Battle. Richmond: Garret and Massie, 1939.
- Leinbaugh, Harold P., and John D. Campbell. The Men of Company K. New York: William Morrow and Company, Inc., 1985.
- MacDonald, Charles B. A Time For Trumpets: The Untold Story of the Battle of the Bulge. New York: Bantam Books, 1984.

- _____. The Battle of the Huertgen Forest. New York: The Berkley Publishing Group, 1963.
- _____. The Last Offensive. Washington: Government printing Office, 1973.
- _____. The Siegfried Line Campaign. Washington: Government Printing Office, 1963.
- Mason, David. Who's Who in World War Two. Boston: Little, Brown and Company, 1978.
- Mellenthin, F.W. von, Major General. Panzer Battles: A Study of the Employment of Armor in the Second World War. Norman: University of Oklahoma Press, 1956.
- Miller, John, Jr. Guadalcanal: The First Offensive. Washington: Government Printing Office, 1949.
- Parker, Danny S. Battle of the Bulge: Hitler's Ardennes Offensive, 1944-45. Philadelphia: Combined Books, 1991.
- Patton, George S., General. War As I Knew It. New York: Bantam Books, 1947.
- Perret, Geoffrey. There's A War To Be Won: The United States Army In World War Two. New York: Ballantine Publishers, 1993.
- Ruppenthal, Roland G. Logistical Support of the Armies, Volume 1, May 1941 to September 1944. Washington: Government Printing Office, 1953.
- Scales, Robert H., Jr. Brigadier General, editor. Certain Victory: The US Army in the Gulf War. Washington: Government Printing Office, 1993.
- Van Creveld, Martin. Fighting Power: German & U.S. Army Performance, 1939-1945. Westport: Greenwood Press, 1982.
- Weigley, Russell F. Eisenhower Lieutenants: The Campaign of France and Germany, 1944-1945. Bloomington: Indiana University Press, 1981.

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